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SUMMARY
OF THE
ADMINISTRATION
OF
THE EARL OF MINTO,
VICEROY AND GOVERNOR-GENERAL OF INDIA,
IN THE
PUBLIC WORKS DEPARTMENT.

NOVEMBER 1905 TO NOVEMBER 1910.



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TABLE OF CONTENTS.

PART I.

	Page.	Para.
IRRIGATION—		
Classification of irrigation works in general, and financing of those of protective category	1	1
Financial relation between local Governments and supreme Government in respect of protective works	1	2
Financing of, and results expected from productive works	1	3
Minor works	1	4
Expenditure contemplated by Irrigation Commission and actuals of recent years	1—2	5
Principal projects in progress or under investigation	2—3	6
Latest recorded statistics relating to irrigation	3	7
NAVIGATION—		
Limited scope for navigation works	3	8
BUILDINGS AND ARCHITECTURE—		
Results of policy of employment of Architects ; principal building projects sanctioned or in course of erection	3—4	9
DOCKS AND HARBOURS	4	10
COAST LIGHTS—	4	11
STORES—		
Purchase of stores for the use of the Public Works Department	4	12
ELECTRICITY—		
Indian Electricity Act	5	13
Revision of the rules under the Indian Electricity Act	5	14
Appointment of Electrical Inspectors	5	15
General	5	16
MISCELLANEOUS—	6	17
ESTABLISHMENTS—	6	18
DECENTRALIZATION—	6	19

TABLE OF CONTENTS.

PART II.

	Page.	Para.
IRRIGATION—		
Classification of Irrigation works	1	1
PROTECTIVE WORKS.		
BENGAL—		
Dhaka Canal	1	2 (a)
Tribeni Canal	1	2 (b)
UNITED PROVINCES OF AGRA AND OUDH—		
Ken Canal project	1	3 (a)
Betwa Canal reservoir at Dhukwan	1—2	3 (b)
Ait-Garhar distributary system, Hamirpur branch of the Betwa Canal.	2	3 (c)
Ghori Nadi storage scheme	2	3 (d)
Belan Canal	2	3 (e)
Dhassân Canal	2—3	3 (f)
Pahuj Garhmanu Canal project	3	3 (g)
Programme of protective Irrigation works	3	3 (h)
CENTRAL PROVINCES—		
Ramtek reservoir project	3	4 (a)
Mâhanadi and Tandula Canal projects	3—4	4 (b)
Nullesar tank project	4—5	4 (c)
Small tank projects	5	4 (d)
Khairbandha tank	5	4 (e)
Ghorajheri tank	5	4 (f)
Chandpur tank	5	4 (g)
Weinganga canal	6	4 (h)
Programme of protective irrigation works	6	4 (i)
BOMBAY PRESIDENCY—		
Schemes for protective irrigation works, Bombay Deccan ...	6—7	5 (a)
Godâveri irrigation project... ..	7	5 (b)
Nira Right Bank Canal project	7	5 (c)
Gokak storage and canal extension project	7	5 (d)
Pravâra river irrigation project	8	5 (e)
Chankapur storage reservoir project	8	5 (f)
Protective irrigation surveys in Khandesh and Gujarat ...	8	5 (g)
MADRAS PRESIDENCY—		
Bhavanasi tank	9	6 (a)
Gazuladinne reservoir project	9	6 (b)
Tungabhadra project	9	6 (c)
Protective works surveys, Madras Presidency	9—10	6 (d)
Mopad and Rallapad reservoir projects	10	6 (e)
Venkatapuram tank project	10	6 (f)
Kistna reservoir project	10—11	6 (g)

PRODUCTIVE WORKS.					Page.	Para.
NORTH-WEST FRONTIER PROVINCE—						
Upper Swat River Canal	...	...	...	...	11	7 (a)
Lower Swat River Canal	...	...	...	...	12	7 (b)
Paharpur Canal	...	...	...	...	12	7 (c)
PUNJAB—						
Central Canal Workshops at Amritsar	...	...	...	...	12	8 (a)
Utilization of the Sutlej river waters	...	...	...	...	12	8 (b)
Dhingana Canal project	...	...	...	...	12—13	8 (c)
Remodelling and extension of Niaz Beg distributary, Upper Bari-Doab Canal	...	...	...	...	13	8 (d)
Water-logged land in certain tracts in the Punjab	...	...	...	...	13	8 (e)
Triple canals project	...	...	...	...	13—14	8 (f)
Incidence of the cost of rectangular and soil surveys on the Upper Chenab and the Lower Bari Doab canals	...	...	...	...	14—15	8 (g)
Khánki Weir, Lower Chenab Canal	...	...	...	...	15	8 (h)
Distribution of canal water by modules or meters	...	...	...	...	15	8 (i)
BOMBAY PRESIDENCY—						
Choi Branch Canal	...	...	...	...	15	9 (a)
Improvement of the existing inundation canals and provision of perennial irrigation in Sind	...	...	...	...	15	9 (b)
The Sind projects	...	...	...	...	15—16	9 (c)
Eastern Nara project	...	...	...	...	16	9 (d)
New regulator, Begari Canal	...	...	...	...	16	9 (e)
Ghotki Canal project	...	...	...	...	16	9 (f)
Jamrao Canal	...	...	...	...	16	9 (g)
Dad Canal	...	...	...	...	17	9 (h)
Nasrat Canal	...	...	...	...	17	9 (i)
Mabiwah irrigation project	...	...	...	...	17—18	9 (j)
Water-supply scheme for the Poona and Kirkee Cantonments	...	...	...	...	18	9 (k)
Mutha Canal	...	...	...	...	18—19	9 (l)
Khelat Canal	...	...	...	...	19	9 (m)
Double embanking of the Indus river in Sind	...	...	...	...	19	9 (n)
BENGAL—						
Tolly's nullah improvement scheme	...	...	...	...	19	10
UNITED PROVINCES OF AGRA AND OUDH—						
Fatehpur Sikri distributary extension of the Agra Canal	...	...	...	...	19	11 (a)
Sarda-Ganges-Jumna feeder scheme	...	...	...	...	20	11 (b)
Hathras Branch, Upper Ganges Canal	...	...	...	...	20	11 (c)
MADRAS PRESIDENCY—						
Godavari delta system	...	...	...	...	20	12 (a)
Cauvery reservoir project	...	...	...	...	20	12 (b)
Appapuram drainage and irrigation schemes	...	...	...	...	21	12 (c)
Chapad project...	...	...	...	...	21	12 (d)
Siddapur tank project	...	...	...	...	21	12 (e)
Divi Pumping project	...	...	...	...	21	12 (f)
Cauvery delta system	...	...	...	...	21	12 (g)
Nagavalli river project	...	...	...	...	21—22	12 (h)

				Page.	Para.
BURMA—					
Shwebo Canal	...	...	...	22	13 (a)
Mandalay Canal	...	...	...	22	13 (b)
Ye-u Canal project	...	...	...	22—23	13 (c)
Môn Canals ...	...	...	...	23	13 (d)
CENTRAL PROVINCES—					
Asola Mendha tank	...	...	...	23	14
Classification of certain canal systems as productive public works				23	15
MINOR WORKS.					
BENGAL—					
Magra Hat drainage project...	...	...	...	24	16
BOMBAY PRESIDENCY—					
Hullur Tank project	...	...	...	24	17
BALUCHISTAN—					
Scheme for completion of Pakur Khan's Karez	...	...	...	24	18 (a)
Nar Nullah reservoir project	...	...	...	24	18 (b)
BURMA—					
Henzada embankment	...	...	...	24—25	19 (a)
Embankment and reclamation works	...	...	...	25	19 (b)
Dredging plant for Twante canal project	...	...	...	25	19 (c)
UNITED PROVINCES—					
Sukhra Nadi scheme	...	...	...	25—26	20
COORG—					
Proposed anicut across the Harangi river	...	...	...	26	21
INLAND NAVIGATION.					
EASTERN BENGAL AND ASSAM—					
Navigable waterways of India	...	...	...	26	22
BENGAL AND EASTERN BENGAL AND ASSAM—					
Madaripur Bhil route	...	...	...	26	23
BURMA—					
Twante Canal ...	...	...	...	27	24
COMMUNICATIONS—					
Gomal river bridge on Murtaza-Wana road	...	...	...	27	25
Roadway over the railway bridge at Nowshera	...	...	...	28	26
Kodigey bridge at Coorg	...	...	...	28	27
Irish bridge at Ghata Billod, Central India	...	...	...	28	28
High level Teesta Valley road	...	...	...	28	29
BUILDINGS—					
Offices and quarters for the Viceregal Staff at Calcutta	...	...	...	28	30
Alterations to the Council Chamber in Government House, Calcutta	...	...	...	29	31
Viceregal estate buildings, Simla	...	...	...	29	32
"The Retreat", Mashobra	...	...	...	29	33
Rules for management of Viceregal estates	...	...	...	29—30	34
'Snowdon,' Simla	...	...	...	30	35
Proposed Civil Secretariat building on the Kennedy House site at Simla	...	...	...	30—31	36
Commerce and Industry Department Secretariat building in Council House Street, Calcutta	...	...	...	31	37

	Page.	Para.
New Presidency Jail, Calcutta	31	38
Dhuromtollah Press buildings, Calcutta	31	39
'Belvedere', the residence of His Honour the Lieutenant-Governor of Bengal	31	40
Extension of the Calcutta Museum	32	41
Quarters for gazetted officers permanently located in Calcutta ...	32	42
Removal of the Civil Engineering College from Sibpur and its reconstruction at Ranchi	32—33	43
Central Lunatic Asylum for natives at Ranchi	33	44
Accommodation for officials in Burdwan	33	45
Government House, Dacca	33	46
Government House, Chittagong	33	47
Dacca Secretariat building	33	48
Permanent and temporary buildings at Dacca	33—34	49
Dacca College Project	34	50
Arts College and School of Engineering, Dacca	34	51
Residences for Government officials at Dacca and Shillong	34	52
Government House, Shillong	34	53
Ballroom at Government House, Lucknow	34—35	54
Medical College Hospital at Lucknow	35—36	55
Circuit House at Dehra Dun	36	56
Rent-free occupation by indigent widows of certain buildings at Chunar	36	57
Currency Office, Cawnpore	36	58
Monotype Press building, Simla	36	59
Acquisition of properties at Simla	36	60
Quarters for Government of India clerks at Simla	36—37	61
Office of the Accountant-General, Lahore	37	62
New General Hospital, Rangoon	37	63
Quarters for Government officials at Rangoon	37—38	64
New Telegraph Office, Rangoon	38	65
Burma rent assessment system	38	66
Gwalior Residency building	38—39	67
New Daly College, Indore	39	68
Indore Residency	39	69
Mayo College Annexe, Ajmere	39	70
Government House, Ootacamund	39	71
New prison at Andheri, Bombay	39—40	72
Circuit-houses at Belgaum and Ahmedabad	40	73
Quarters for certain officers at Bombay	40	74
Bushire buildings	40	75
New civil buildings, Peshawar	40	76
Guest House at Peshawar	40—41	77
New Postal Audit Office, Nagpur	41	78
New Jail for Secunderabad Cantonment	41	79
Circuit-houses and residences of heads of Administrations	41	80
Basis of estimating outlay admissible on residential buildings for Government officials	41	81

ELECTRIC INSTALLATIONS—

Upkeep of electrical installations in Government residential buildings... ..	41—42	82
Installation of electric lights and fans at Government House, Guindy (Madras)	42	83
Installation of electric lights and fans at Government House, Malabar Point, Bombay	42	84
Installation of electric lights at Government House, Ganeshkind, Bombay	42	85

	Page.	Para.
Electrical installation at the Quetta Residency	42	86
Installation of electric light and fans at the Indore Residency ...	42	87
MISCELLANEOUS—		
Churches for troops	42—43	88
Basis of calculating grants for military and railway churches ...	43	89
Subsidiary works connected with churches	43—44	90
Liability of the State in respect of the maintenance of church compounds	44	91
Designs prepared by Consulting Architect	44—47	92
DOCKS AND HARBOURS—		
Improvement of Madras Harbour	47—48	93
New Docks at Bombay	48	94
Port of Calcutta	48—49	95
Port of Chittagong	49—50	96
Improvement of the Port of Moulmein	50	97
Training of the Rangoon river	50—52	98
Vizagapatam Harbour Improvement	52	99
COAST LIGHTS—		
Burma Coast Light	52—53	100
Beacon Island light house	53	101
Alguada-Reef light house	53	102
STORES—		
Purchase of stores for the use of the Public Works Department ...	53—54	103
Revised financial powers of Public Works Department officers in respect of the local purchase of stores of foreign manufacture	54	104
ELECTRICITY—		
Indian Electricity Act, No. IX of 1910	54—55	105
Revised rules under the Indian Electricity Act	55	106
Grant of electric licenses	55—57	107
Concession for water power on the Bari-Doab Canal	57	108
Proposed grant of a concession for the use of water power on the Jumra river	57	109
Grant to licensees under the Indian Electricity Act, 1903, of the powers which the telegraph authority possesses under sections 10 to 19 of the Indian Telegraph Act, 1885	57	110
Revocation of licenses :—		
The Lucknow Cantonment Electric License, 1907, and the Lucknow Cantonment Electric Traction License, 1907	57	111(i)
The Jubbulpore (Cantonment) Electric License, 1907	58	111(ii)
International Conference on electrical units and standards	58	112
Establishment of a standard electrical laboratory in Calcutta ...	58—59	113
Supply of electrical energy to the Temperance Association room in Fort St. George	59	114
Agreement for the supply of electric energy to Government buildings in Rangoon	59	115

	Page.	Para.
Special charges for large consumers of electricity for the areas covered by the Calcutta Municipal and Cantonment electric licenses	59	116
Agreement for lighting the streets of the Barrackpore Cantonment	59	117
Combined undertakings for electric traction and the general supply of electric energy for lighting and power ...	59	118
International Electro technical Commission	59	119
Prospects of generating electricity from water power in certain provinces	59—60	120
Electric-power schemes in India	60	121
Works inspected by the Electrical Adviser to the Government of India and projects on which he advised Local Governments	60—61	122
Rangoon Electric License	60	122 (i)
Electric Installation in the Agricultural College at Pusa ...	60	122 (ii)
Electric Power Installation for Poona from the Nira Canal ...	60	122 (iii)
Electric Installation at Government House, Peshawar ...	60	122 (iv), (v)
Electric Installation at the Bombay Mint	60	122 (vi)
License for the supply of electric energy in Calcutta and its surroundings	60	122 (vii)
Bombay Hydro-Electric License	60	122 (viii)
Electric Lighting, Quetta Residency	61	122 (ix)
Electric Lighting, Shillong	61	122 (x)
Madras Electric Supply	61	122 (xi)
Patiala Electric Supply	61	122 (xii)
Barrackpore Public Lighting	61	122 (xiii)
Mussoorie Hydro-Electric Scheme	61	122 (xiv)
Indore Residency Electric Installation	61	122 (xv)
Simla Hydro-Electric Project	61	122 (xvi)
Chittagong Government House and the Circuit-House ...	61	122 (xvii)

MISCELLANEOUS—

International Road Conferences	61—62	123
Plassey Obelisk	62	124

ESTABLISHMENTS—

Summary of measures affecting the establishment	62	125
Strength and recruitment of the engineer establishment ...	62—63	126
New appointments created	63—64	127
Separation of the Imperial and Provincial Engineer establishments.	64—66	128
Revision of pay of Royal Engineer officers serving in the Public Works Department.	66	129
Proposed creation of a separate service of Sanitary Engineers ...	66—67	130
Relaxation of the fifty-five year rule	67	131
The Minor Administrations List	67	132

	Page.	Para.
DECENTRALIZATION—		
Introduction	67	133
Paragraph 206 of the Commission's Report—Enhancement of powers to sanction works debited to current revenues ...	67—68	134
Paragraph 207. Free consultation of the Government of India Architect by local Governments	68	135
Paragraph 208. Enhancement of final powers of sanction of ordinary imperial projects	68	136
Paragraph 209. Enhancement of powers of acceptance of tenders for the execution of works	68	137
Paragraphs 210-211. Enhancement of Engineer's technical powers of sanction	68—69	138
Paragraph 212. Enhancement of powers of sanction regarding Government and circuit houses	69	139
Paragraphs 213-15. Enhancement of powers in respect of residential buildings	69—70	140
Paragraph 217. Execution of petty works by non-professional agency	70	141
Enhancement of the powers of Local Governments in respect of certain irrigation works	70	142
Delegation of powers in respect of the appointment and promotion of Superintending Engineers	71	143
Direct recruitment by Local Governments of their provincial engineer and upper subordinate establishments	71	144
Powers of Local Governments in respect of Public Works establishments	71	145
Minor measures of decentralization	71	146

PART I.

PUBLIC WORKS DEPARTMENT.

Irrigation.—Irrigation works in India are divided into three classes, *viz.*, *Classification of irrigation works in protective, productive, and minor works. Protective works are designed primarily to protect the tracts served from the ravages of famine; they do not as a rule return any large direct profit to the State and in the technical sense are not remunerative. They, however, serve to reduce expenditure on famine relief and remissions of revenue in tracts subject to drought, and besides fulfilling their primary purpose of preventing or mitigating the effects of famine, they may be said to be indirectly remunerative. Works of this class are financed from the current revenues of the country, and hitherto a moiety of the famine insurance grant of £1,000,000, less the comparatively small sum allotted to protective railways, has been available for their construction. The protective programme includes schemes which would not formerly have been deemed sufficiently remunerative to undertake at all: it has now reached such dimensions that due progress with it demands the allotment of more than a moiety of the famine insurance grant, and the Government of India have decided, with the sanction of the Secretary of State, to increase the allotment by a sum not exceeding Rs. 25 lakhs whenever the financial situation permits.*

2. The question of revising the financial arrangements with local Governments in such a way as to give them a more direct financial stake in protective works than obtains under the present system, is now engaging the attention of the Government of India. *Financial relation between local Governments and Supreme Government in respect of protective works.*

3. Productive works are financed from loan funds and when fully developed are expected, after paying all working expenses, to provide a balance of net revenue sufficient to repay the annual interest on the capital invested. *Financing of, and results expected from productive works.*

4. Minor works consist partly of small works originally constructed by the former rulers of the country or owners of the soil and which are now controlled and maintained by the Government, and partly of works not sufficiently important to justify treatment as major works. Such works are undertaken for the general improvement of the country or for general administrative purposes and are paid for out of ordinary revenues. *Minor works:*

5. The subject of the further development of irrigation in India was investigated in 1901-1903 by a Commission under the presidency of Sir Colin Scott-Moncrieff, K.C.S.I., K.C.M.G., and the report of that body added materially to the knowledge of the potentialities of irrigation in this country, and also indicated the principles which should govern the irrigation policy of the State. The Commission *inter alia* recommended the adoption of a programme of construction which contemplated the expenditure of a sum of 44 crores of rupees in 20 years or an average of 220 lakhs a year. Although, owing principally to the want of sufficiently matured schemes, expenditure in the years immediately following the issue of the Commission's report fell short of the average recommended, our present-day expenditure has not only attained but *Expenditure contemplated by Irrigation Commission, and actuals of recent years.*

has exceeded that standard. The figures for the past few years are given in the table below ; which includes the budget provision for 1910-1911 :—

Year.	Productive.	Protective.	Total.
	Rs.	Rs.	Rs.
1905-1906 (Actuals)	83,42,910	44,48,589	1,27,91,499
1906-1907 („)	1,19,61,406	53,46,895	1,73,11,301
1907-1908 („)	1,26,85,822	62,58,602	1,89,44,424
1908-1909 („)	1,47,52,338	60,15,453	2,07,97,769
1909-1910 (Revised estimate)	1,60,00,000	72,00,000	2,32,00,000
1910-1911 (Budget estimate)	1,70,00,000	70,00,000	2,40,00,000

*Principal projects
in progress or under
investigation.*

6. The very marked growth of expenditure on productive works is due principally to a project now under construction in the Punjab, known as the Triple canals project. This is a large work of a daring character and aims at utilising to the full the supplies carried by the Chenab and Jhelum rivers. It involves carrying a portion of the water of the Jhelum river across the Chenab and the water of the Chenab across the Ravi. Three distinct irrigation systems, known as the Upper Jhelum, Upper Chenab, and Lower Bari Doab canals, will thus be formed. About one-third of the work on this project, which will probably cost about 10 crores of rupees by the time it is finished, has been completed and the expenditure on it in recent years has absorbed more than half the total available grant for productive works throughout India. Of other productive irrigation works in progress, it will suffice to mention the Upper Swat canal in the North-West Frontier Province and the Mon and Ye-u canals in Burma. The Swat canal is a project possessing features of special interest. It involves the construction of large works in tribal territory and an amount of tunnelling never before attempted in canal construction. The scheme is likely to be politically advantageous in quieting the trans-frontier tribes. The more important protective works sanctioned or under construction are the Tandula canal in the Central Provinces, the Pravâra and the Godâveri in Bombay, and the Dhassân canal in the United Provinces.

Several large and important irrigation schemes are now under investigation. Of these the largest concerns Sind. It is proposed to divide the Indus into three reaches, each with its river weir and group of canals. The aggregate cost of these schemes is expected to exceed 17 crores of rupees. Another large project in course of investigation is that for the utilisation of the waters of the Sutlej below the junction of this river with the Beas. This scheme contemplates the co-operation of the Bikanir and Bahâwalpur States.

In Madras, two important projects are now under preparation—the Cauvery and the Kistna—which are estimated to cost 4 and 7 crores of rupees respectively.

In the United Provinces, a scheme, conceived on very bold lines and known as the Sarda-Ganges-Jumna feeder project, is now being investigated. The idea is to carry the water of the Sarda river in Oudh into the Ganges and Jumna tracts so as to bring under command fresh areas in the United Provinces and the south-east of the Punjab.

All these works, it is hoped, will be productive.

7. The following table exhibits the latest recorded statistics of the results attained by the several classes of irrigation works in operation in India :—

Latest recorded statistics relating to irrigation.

Classification of works.	Number of works.	Capital outlay.	Area irrigated.	Net Revenue after paying working expenses.	Return on Capital outlay.
		Rs.	Acres.	Rs.	Per cent.
I. Productive (including Native States Punjab)	53	41,90,53,392	14,623,991	3,44,40,508	8.21
II. Protective	17	2,52,12,080	352,103	2,02,906	72
III. Minor Works for which Capital and Revenue Accounts are kept (including works under construction)	94	6,06,14,690	19,67,420	29,73,013	4.90
IV. Minor Works for which only Revenue Accounts are kept . . . . .	...	...	2,416,632	19,94,638	...
V. Minor Works for which neither Capital nor Revenue Accounts are kept . . . .	...	...	3,403,231	42,03,374	...
TOTAL ...	164	50,94,80,162	22,763,377	4,38,14,529	...

8. **Navigation.**—The impracticability of combining the functions of irrigation and navigation in the same channels has long been established in India and no modern irrigation projects are burdened with the cost of the additional works necessary to make the canals navigable. There is very little scope for successful inland canals in India with its network of railways. On the other hand, much has been done and more is contemplated in the estuaries of Bengal and Burma to improve the old waterways.

Limited scope for navigation works.

9. **Buildings and Architecture.**—The period under review has witnessed steady progress in the policy of endeavouring to improve the quality of the building work of the Public Works Department, a policy which may be said to have resulted in the appointments of Consulting Architect to the Government of India, and to the Governments of Bombay, Madras, Bengal and Eastern Bengal and Assam.

Results of policy of employment of architects; principal building projects sanctioned or in course of erection.

Some growth in the employment of architects in the Public Works Department was to be anticipated as a natural concomitant to the abolition of the Royal Indian Engineering College and the beginning of a gradual disappearance of the Cooper's Hill type of Public Works officer, trained to some extent in architecture.

Among the principal buildings under construction during the period dealt with in this review may be mentioned the Agricultural Colleges at Pusa in Bengal, at Poona in Bombay, and at Cawnpore in the United Provinces; the High School at Ahmedabad and the Police Training College at Ranchi; the Jacob

Sassoon Hospital, at Poona, the General Hospital at Karachi, the Presidency General and Medical College Hospitals at Calcutta, the Rangoon General Hospital, and the Sir W. Moore operating theatres attached to the Jamssetjee Jeejeebhoy Hospital at Bombay ; new office buildings for the Secretariat, etc., at Nagpur, for the Public Works Department at Lahore, for the Accountant General at the same station, for the Commerce and Industry Department, Calcutta, for the Eastern Bengal and Assam Secretariat at Dacca, for the new General Post Office at Bombay, the Central India Agency at Mount Abu, the Viceregal stables and staff residences, Calcutta, and Government Houses at Dacca and Chittagong. These are a few among the many buildings and building projects which have been either wholly or partially erected in the period, and on the design of which architects have generally been employed. The more important projects recently sanctioned are the Medical College and Hospital, Lucknow, the Calcutta Museum extension scheme, and the new press in Dhurromtollah Street, Calcutta. Details will be found in Part II of this summary.

10. Docks and Harbours.—Much attention has been given to the amelioration of shipping facilities. Among other important schemes completed, or under contemplation, such as the Madras Harbour scheme, new docks at Bombay, improvements to the ports of Calcutta, Chittagong and Moulmein and training of the Rangoon river, is the question of the improvement of the harbour of Vizâgapatâm which has been under consideration for many years past. The extension of the neighbouring railway communications, the geographical position of Vizâgapatâm, and the natural configuration of the site combine to render it of great importance to provide harbour accommodation on a scale commensurate with the steadily increasing volume of trade frequenting that port. After the careful consideration of various proposals by English harbour experts, a scheme for an enclosed harbour is now under consideration by the local Government.

11. Coast Lights.—The subject of generally improving the lighting of the coasts has received attention and, where the necessity has been recognised, improvements including the erection of new light-houses, have been carried out. Among others may be mentioned the construction of a new light-house on Beacon Island and general improvements to the lighting apparatus on the Burmese coast.

STORES.

12. Purchase of stores for the use of the Public Works Department.—A committee was appointed in February 1906 to enquire into the procedure for the purchase of stores for the use of Government departments in India and to submit proposals for effecting improvement in the existing system. As a result of the committee's recommendations certain modifications were made in the rules for the purchase of stores, with the previous sanction of the Secretary of State. It was impressed on all concerned that the policy of Government is to encourage the purchase of articles locally manufactured or produced, and that preference should be given to such articles when the quality is satisfactory and the price not unfavourable.

The limits of power of Public Works officers to purchase locally stores of foreign manufacture were enhanced.

ELECTRICITY.

13. Indian Electricity Act.—A measure of some importance, which was undertaken during the period under review, consisted in the revision of the Indian Electricity Act, No. III of 1903. It had been brought to the notice of the Government of India that the important question of industrial power supply was likely to come to the fore in the near future but that progress in this direction was, to some extent, unintentionally retarded by the legislation undertaken in 1903 with a different intention. A committee was accordingly appointed in 1907 to consider the question of the necessity for amending the Indian Electricity Act of 1903. This committee recommended very extensive amendments in that Act. After ascertaining the views of local Governments and administrations and the several chambers of commerce and companies interested in the matter of electrical enterprise, a Bill was introduced in Council, with the sanction of the Secretary of State, in July 1909 and passed into law, with certain modifications, in March 1910, as the Indian Electricity Act, No. IX of 1910.

14. Revision of the rules under the Indian Electricity Act.—The rules under the Indian Electricity Act of 1903 were revised by a technical advising committee appointed in 1908 for the purpose. The committee were of opinion that the rules as revised by them would meet all requirements under the new Act. The revised draft rules have been published, with slight modifications, in the Gazette of India for general information and criticism, and will, with such further modifications as may be found necessary, be issued in due course as rules under the Indian Electricity Act of 1910.

15. Appointment of Electrical Inspectors.—The necessity having arisen, local Governments were empowered by a Notification, issued in September 1906, to appoint by name or by virtue of his offices, one or more duly qualified persons to be Electrical Inspectors for the purposes of the Indian Electricity Act, 1903, and the rules thereunder.

16. General.—Several licenses were granted under the Indian Electricity Act of 1903 for the supply of electricity in different parts of India and Burma during the period under review, and some of the larger cities are now served by prosperous electric lighting and tramway undertakings.

Electrical measurements for commercial purposes have almost reached finality in Europe and America, and steps have now been taken to establish, in Calcutta on a modest scale, an electrical laboratory for purposes of standardizing such measurements in India.

Water power being available in many places, it is being gradually developed wherever a demand for electrical power exists or can be created. The coal and oil fields also offer great possibilities for the development of the industry, and the production, electrically, of both iron and steel are receiving attention. Owing to the somewhat special climatic condition manufacturers of electrical apparatus have, in recent years, introduced goods specially designed to meet the requirements of the Indian market. There is very little local manufacture of this kind at present.

17. Miscellaneous.—(See paragraphs 123 and 124 of Part II).

18. Establishments.—The more important matters affecting the Public Works establishments which have been considered during Lord Minto's Viceroyalty comprise measures dealing with the strength, recruitment and organization of the engineer services. Detailed particulars as to how these questions have been settled, or now stand, are given in Part II, paragraphs 125-132.

19. Decentralization.—Detailed particulars of how the questions relating to the Public Works Department have been settled, or now stand, are given in paragraphs 133 to 146 of Part II.

PART II.

PUBLIC WORKS DEPARTMENT.

Irrigation.

1. **Classification of Irrigation works.**—The classification of irrigation works is described in Part I of this Summary.

PROTECTIVE WORKS.

2. **Bengal.**—*Dhaka Canal.*—(a) This work was started in 1901, during the Viceroyalty of Lord Curzon and completed in March 1908, at a total cost of Rs. 5,89,555.

(b) *Tribeni Canal.*—Execution of this work was commenced in the early part of 1901-02. The amount of the original estimate was Rs. 37,91,789, but as the project had been prepared in some haste during famine, a revised estimate amounting to Rs. 51,35,328 was found necessary and was duly sanctioned by the Secretary of State. Since then a shoaling up of the river bed at the existing site has imperilled the efficiency of the head works, and remedial measures will in consequence have to be undertaken. This occurrence has necessitated a still further revision of the estimate which has not yet reached the Government of India. The question of the division of the revenue receipts and working expenses (including interest) between the local and Imperial Governments is now under consideration.

3. **United Provinces of Agra and Oudh.**—(a) *Ken Canal project.*—The Ken Canal project was sanctioned in 1903 by the Secretary of State at an estimated cost of Rs. 33,45,388, but as subsequently it became evident that the scope of the canal could be considerably extended and the financial results sensibly improved, a revised estimate amounting to Rs. 53,86,165, inclusive of provision for a supplementary storage reservoir known as the Gangao dam, was submitted in March 1909 to the Secretary of State, whose sanction was accorded on the 4th May 1909.

Despatch No. 7-P.W., dated 11th March 1909, to Secretary of State.
Telegram dated 4th May 1909, from Secretary of State.

The construction estimate for this canal was closed on 31st March 1910 and the completion report is now under consideration.

(b) *Betwa Canal reservoir at Dhukwan.*—The Government of India sanctioned against the open capital account of the Betwa system an estimate amounting to Rs. 12,08,214 for this reservoir in the year 1904. The work consisted of a masonry dam 4,415 feet in length and of a maximum height of 37 feet; a return of 3·7 per cent was anticipated on the capital outlay. It was subsequently found necessary to sanction a revised estimate amounting to Rs. 12,41,502.

In 1907 the Government of the United Provinces submitted a second revised estimate amounting to Rs. 21,89,263. This sum having, on examination by the Government of India, been found insufficient, the project was returned for modification. The revised estimate, after the necessary amendment, amounted to Rs. 30,53,093, provision having been added for remodelling the Hamirpur Branch and the Jalaun distributaries of the canal. The project thus expanded is expected to bring an area of 73,125 acres under irrigation, yielding a net revenue of Rs. 1,50,375 which is equivalent to a return of 4·94

per cent on the total capital outlay. The revised estimate was submitted to the Secretary of State in May 1903 and sanctioned by him in the following July.

Despatch to Secretary of State, No. 13-P.W., dated 14th May 1908.

Despatch from Secretary of State, No. 36-P. W., dated 24th July 1918.

(c) *Ait-Garhar distributary system, Hamirpur branch of the Betwa Canal.*—In June 1907, the Government of India sanctioned an estimate amounting to Rs. 1,09,357, (direct charges), for the construction of the Ait-Garhar distributary and its system on the Hamirpur Branch of the Betwa Canal, chargeable to the open capital account of that canal. The project is designed to protect the northern portion of pargana Orai, Jalaun district, a tract which is entirely dependent on the rainfall for its well-being and which has suffered severely from droughts.

(d) *Ghori Nadi storage scheme.*—In October 1909, the Government of India sanctioned an estimate amounting to Rs. 3,03,623, for the Ghori Nadi storage scheme, reporting the fact to the Secretary of State. The scheme aims at protecting a tract subject to great distress in times of deficient rainfall. It is estimated that the project will serve to irrigate on an average an area of 6,139 acres a year, and will yield an average net revenue of Rs. 14,283 *per annum* or 4·7 per cent on the capital outlay ten years after completion.

Despatch No. 31-P. W., dated 23th October 1903, to Secretary of State.

(e) *Belan Canal.*—In 1907 the Government of the United Provinces submitted a preliminary report accompanied by a rough estimate (Rs. 9,56,899) for the construction of a canal from the Belan river to serve a portion of the Khairgarh pargana of the Allahabad district which is peculiarly liable to famine, and which was particularly afflicted by the famine of 1907-08. The local Government two years later submitted a modified estimate amounting to Rs. 14,40,233, the excess on the previous preliminary estimate being due chiefly to the provision of additional storage at a cost of Rs. 4,29,329. In the meanwhile, permission was given to the starting of actual work, as a measure of famine relief, in the event of such a course becoming necessary. The scheme has been projected to command an area of 74,797 acres, of which 62,797 are in British territory and 12,000 in the Rewah State. Attention was drawn to the importance of affecting an early arrangement with the Rewah State regarding a strip of land in that territory which had to be traversed by the canal. The local Government suggested certain terms under which the Rewah State should participate in the construction of the canal, and the matter is now under negotiation between the Agent to the Governor General, Central India, and the Rewah Durbar.

(f) *Dhassán Canal.*—Sanction was first accorded to an estimate amounting to Rs. 40,39,897 for the construction of this canal in March 1905, and the work was at once put in hand. The project was calculated to yield a net annual revenue of Rs. 1,09,083 equal to a return of 2·7 per cent on the capital cost. In 1908, the Government of the United Provinces brought to notice the probability of the estimate being increased by about 5 lakhs of rupees, and the circumstance was reported to the Secretary of State in December of the same year.

Despatch No. 35-P.W., dated 10th December 1903, to the Secretary of State.

The revised estimate amounting to Rs. 45,16,227 was received from the local Government in July 1909. The return expected from the revised scheme is put at Rs. 1,38,100 a year or 3·06 per cent on the capital invested.

The amended project, which was duly submitted to, and sanctioned by the Secretary of State, consists of the following works :—

Despatch No. 15-P.W., dated 31st March 1910, to Secretary of State.

Despatch from Secretary of State, No. 17-P.W., dated 17th June 1910.

- (i) A masonry storage dam at Pahâri with a crest length of 1,980 feet and maximum height from the river bed of 73 feet.
- (ii) A secondary masonry dam at Lachura on the same river about 5 miles down-stream of the one at Pahâri to hold up water for the canal. This work is 1,770 feet long between abutments, and the crest is 43 feet above the river bed.
- (iii) About 88 miles of main and branch canals, and 216 miles of distributaries.

(g) *Pahuj-Garhmanu canal project*.—This project which aims at protecting from famine the northern portion of the Jhansi district, a tract that invariably suffers in times of scarcity and in which large areas now lie uncultivated for the want of irrigation facilities, was sanctioned in August 1909 for Rs. 8,65,040. The scheme provides for the construction of two reservoirs one at Garhmanu and the other on the Pahuj river with connected canal systems 44 and 48 miles long, respectively. It contemplates ultimately the irrigation of 18,500 acres from which a net revenue of Rs. 37,998, which is equivalent to 4·4 per cent on the capital outlay, is expected to be realized.

(h) *Programme of protective irrigation works*.—Towards the close of 1905, the United Provinces Government submitted a programme for constructing works (including those which were then under construction) for the protection of the precarious tract lying to the south of the Jumna. It showed the order in which the local Government proposed to take up the new works and contemplated an expenditure of 2·40 crores of rupees. The Government of India accepted the programme and said that without guaranteeing the supply of funds they would endeavour to meet the needs as far as possible.

4. **Central Provinces.**—(a) *Ramtek reservoir project*.—In December 1905 the Secretary of State sanctioned an estimate amounting to Rs. 17,15,773 for the construction of a reservoir on the Sur river, and for distributary channels in the Ramtek *tahsil* of the Nagpur district. The reservoir will be formed by impounding the waters of the Sur river by means of a masonry dam across the stream as it passes through a gap in the low hills near the town of Ramtek. It is anticipated that a maximum area of 40,000 acres will be irrigated, yielding a net revenue of Rs. 70,000, which is equivalent to 4·08 per cent on the total capital outlay. Since the estimate was first framed there has been a rise in the value of labour owing to the rapid development of the manganese trade, and this has resulted in an anticipated excess of about Rs. 6,74,790 over the estimate, which has duly been reported to the Secretary of State. The revised estimate has been received and is under consideration.

(b) *Mâhanadi and Tandula canal projects*.—In 1905 the Secretary of State decided to defer sanction to a scheme, which had been advanced by the Government of Lord Curzon, for the irrigation of the Raipur District by means of a canal deriving its supply from the Mâhanadi river, on the grounds that the project presented some doubtful features and that it would be wiser to hold the scheme in abeyance until further experience had been gained from smaller irrigation works in the Central Provinces. These instructions were communicated to the Chief Commissioner, who, after devoting considerable attention to the matter, decided during the early part of 1908 to

Despatch No. 66-P.W., dated 22nd December 1905,
from Secretary of State.

Despatch No. 37-P.W., dated 23rd December 1909,
to Secretary of State.

Despatch No. 66-P.W., dated 22nd December 1905,
from Secretary of State.

advance a more comprehensive scheme of irrigation from the Māhanadi and Tandula rivers. This enlarged scheme was devised to protect not only the Raipur district, but also the neighbouring Drug district from the losses caused by famine, to which both districts were peculiarly liable. The local Administration explained in very emphatic terms the advantages which both the people and Government would derive from the scheme, which aimed at protecting, by means of irrigation, an area of 700,000 acres at an outlay of nearly 230 lakhs of rupees. The lowest computation placed the direct return to the State at 3·7 per cent, and, although this percentage was unusually satisfactory for a protective work, the project was recommended not merely on financial grounds but because it promised to confer material benefits upon the peasantry who had suffered in the past from a succession of severe famines. The Government of India came to the conclusion that the Māhanadi project could not be recommended for sanction in the shape in which it had been prepared, and it was accordingly returned for revision. In doing so, occasion was taken to point out that, in any event, it would be more advantageous to proceed with the Tandula project by itself, firstly, because it was extremely doubtful whether funds would be available to finance both schemes simultaneously, and, secondly, because the Tandula project presented fewer difficulties and points of doubt than the Māhanadi. Early in 1908, the local Administration submitted the Tandula project estimate amounting to Rs. 1,01,14,545, which was subsequently modified and reduced to Rs. 99,98,807.

The scheme is essentially a protective work and consists of a reservoir, a main canal 37 miles long, and two branch canals, 24 and 16 miles long respectively, with distributaries. The total culturable area commanded by the canal is estimated at 608,516 acres of which 263,412 acres will be irrigated annually. The construction of the canal will be completed at the end of the sixth year after starting work, when it is expected that it will irrigate an area of 50,000 acres. It is anticipated that irrigation will not be fully developed until four years later, when a net revenue of Rs. 3,90,927 *per annum* is expected, equivalent to a return of 3·9 *per cent* on the capital outlay, an unusually good result for a work of the protective class.

Despatch to Secretary of State, No. 1-P.W., dated 28th January 1909.
Despatch from Secretary of State, No. 10-P.W., dated 26th March 1909.

The estimate was submitted to the Secretary of State in January 1909 and sanctioned by him in March of the same year.

An estimate amounting to Rs. 8,32,165 for the purchase of machinery for this canal was received in August 1910. The Government of India, however, decided to withhold their sanction both because the proposed outlay greatly exceeded the provision for tools and plant in the project estimate, and because, in their opinion, the circumstances of the case did not justify the employment, to any great extent, of expensive and complicated machinery on a work on which equally satisfactory results would be achieved at less cost by ordinary manual labour. The estimate was accordingly returned to the Central Provinces Administration for revision.

(c) *Nullesar tank project*.—A project for the construction of the Nullesar tank in the Chanda district was in 1905 rejected on the ground that its limited scope did not justify the expenditure and that more promising schemes should be given priority. It was resubmitted the following year but was returned unsanctioned with the suggestion that the scope of the project should be extended so as to embrace certain additional areas. The project was received back in August 1910 and has been revised to accord as far as possible

with the views of the Government of India. In the shape which it has now assumed the scheme is estimated to cost Rs. 6,32,542, including indirect charges, to irrigate 12,000 acres, and to yield a net revenue of Rs. 22,700 *per annum*, or 3·5 per cent on the capital outlay. The scheme is now under consideration.

(d) *Small tank projects*.—Various small, but promising, tank works in the Central Provinces were sanctioned during the period covered by this summary. The works are not sufficiently important to describe individually, but a list of them showing the amount of the estimate and the area each tank is likely to bring under irrigation, is given in the subjoined statement.

Name of project.					Amount of estimate.	Annual irrigation.
					Rs.	Acres.
1. Marowda tank	...	...	...	...	3,77,605	2,436
2. Bainakheri Kurud tank	...	...	...	...	1,61,027	2,189
3. Khapri Aranda tank	...	...	...	...	3,41,324	7,268
4. Kusrangi tank	...	...	...	...	1,29,764	1,130
5. Hargahan tank	...	...	...	...	1,32,638	2,673
6. Wara tank	...	...	...	...	1,92,094	10,207
7. Khaira Dattan tank	...	...	...	...	92,783	1,000
8. Khola tank	...	...	...	...	90,058	600
9. Barera Kalan tank	...	...	...	...	1,73,944	3,113
10. Rumal tank	...	...	...	...	3,08,870	6,000

Most of these small works have been completed and are in operation.

(e) *Khairbandha tank*.—In May 1907, the Government of India sanctioned a revised estimate, amounting to Rs. 3,76,828, for the construction of this work which was originally approved during the Viceroyalty of Lord Curzon. Certain necessary additions and alterations to the scheme necessitated the preparation of a second revised estimate amounting to Rs. 7,15,202 which was sanctioned in February 1910. The tank is situated in the Bhandāra district and is expected to irrigate 15,000 acres and to yield a net revenue of Rs. 23,82 ; or 3·3 per cent on the capital outlay, which will be a favourable result for a work of the protective class.

(f) *Ghorajheri tank*.—In July 1908, the Government of India sanctioned a revised estimate amounting to Rs. 8,32,784 for the construction of this protective irrigation work. The tank is situated in the Chanda district and is expected to irrigate 26,000 acres and to yield a net revenue of Rs. 38,500 equivalent to a return of 4·62 per cent on the capital outlay.

(g) *Chandpur tank*.—In September 1908, the Government of India sanctioned a revised estimate amounting to Rs. 5,91,553 for the construction of this protective work. The tank is situated in the Bhandāra district and is expected to irrigate 16,000 acres and to yield a net revenue of Rs. 20,000 equivalent to a return of 3·31 per cent on the capital outlay.

(h) *Weinganga canal*.—In October 1908, the Government of India approved of the preparation of a detailed project and estimate for the Weinganga canal, serving the Bhandāra and Balaghat districts. The project contemplated the construction of a storage reservoir on one of the affluents of the Weinganga river, with a weir lower down the river, at Dhuti, from which a canal would take off on the right bank to irrigate lands in the doab between the Weinganga and Bawan-Thari rivers. The preliminary estimate submitted by the local Administration, amounted to Rs. 45,14,465, and the revenue was estimated at Rs. 1,96,500, equivalent to a return of about 4 per cent on the capital outlay. The prosecution of the sanctioned Tandula scheme will probably however leave insufficient funds for other large protective irrigation works for some years to come, and the Central Provinces Administration was informed that there was but small prospect of the Weinganga project being sanctioned in the near future unless it can be shown to fulfil the conditions of a productive work.

(i) *Programme of protective irrigation works*.—In October 1907 the Central Provinces Administration submitted a letter discussing at length the policy which it proposed to adopt for the advancement of its irrigation works, a matter about which a certain amount of misapprehension had arisen owing to diverse interpretations of the recommendations which the Irrigation Commission had left on record. The letter gave cover to a programme showing the manner in which the Chief Commissioner proposed to spend the sum of Rs. 300 lakhs which the Irrigation Commission had recommended for expenditure in that Administration during a period of 20 years. After some further correspondence the programme was accepted subject to certain reservations, the Government of India admitting that the views of the Chief Commissioner were in substantial accord with the intentions of the Irrigation Commission.

5. **Bombay Presidency.**—(a) *Schemes for protective irrigation works, Bombay Deccan*.—When the Irrigation Commission were conducting their investigations, they advised the Government of India to have a thorough hydrographic and hydrological survey made of the Western Ghāts, the only reliable source of water-supply for a large portion of the Deccan in this Presidency, which is very liable to be affected by scarcity and famine, owing to the precarious nature of the rainfall.

In February 1906, the Bombay Government submitted for the information of the Government of India a preliminary report on the surveys. Eight projects were surveyed by a Superintending Engineer with a suitable staff during three years. The roughly estimated aggregate cost of these projects was Rs. 16,52,00,000.

In October 1906, the Government of Bombay were furnished with the general views of the Government of India on the subject. The Government of India were of opinion that the main object of protective works should be to render as large an area of country and as large a number of the population as possible secure from famine in years of drought. They considered that, in order to secure this end, a protective irrigation work in the Deccan should ordinarily be designed (subject to necessary limitations of cost) to command three or four times the area which it might be expected to irrigate in a normal year, the share of the total supply to be assigned to each watercourse being proportioned to the area commanded by it, and each landowner within that area being entitled to a proportional share of the supply, so that he might irrigate a

quarter or a third of his holding, which might rise to 40 or 50 per cent in a year of drought. The Bombay Government were also informed that it was especially desirable in the case of a protective work that the distributary system should be completed as soon as possible so as to be ready for use throughout the commanded area in the event of a drought. With regard to the levy of water-rates, the Government of India agreed, subject to consideration, that Government as a monopolist of the water-supply must not permit itself to rack-rate its revenue payers, that the best policy is to take as high a rate as the cultivator can be induced to pay, leaving a suitable margin for profitable cultivation. It was held that so long as that margin is a safe one, a continuance of this policy will tend to reduce the net cost of these irrigation works to a minimum.

(b) *Godâveri irrigation project.*—In July 1906, the Secretary of State

Despatch No. 22-P. W., dated 31st May 1906, to Secretary of State.
Despatch No. 47-P. W., dated 13th July 1906, from Secretary of State.

sanctioned an estimate amounting to Rs. 95,61,011 for this project. The scheme consists of the construction of a storage reservoir, a pick-up weir and two main canals 72 and 48½ miles long, respectively, with the necessary distributaries. The total commanded culturable area is 191,758 acres, one-third of which will, it is expected, be irrigated annually. The return on outlay will be about 2·45 per cent when the project is fully developed. No adequate return is expected as the work is more than justified by its protective character.

(c) *Nira Right Bank canal project.*—In July 1906, the Government of Bombay submitted rough plans and estimates for this work. In soliciting the views of the supreme Government as to the scope of the scheme, the Government of Bombay advocated the construction of a canal commanding an area of 800,000 acres with a length of 250 miles including a considerable length traversing the territory of native states. In reply the local Government were informed, in September 1907, that the project should not be finally designed pending the settlement of the question of co-operation of native states on which subject the Government of India were about to address the Secretary of State. The local Government were also informed that the Government of India were disposed to agree with the recommendation of the Inspector General of Irrigation that a canal about 155 miles long would be more suitable. The question of the policy to be adopted in regard to schemes which affect native state territory formed the subject of correspondence between the Government of India (Foreign Department) and the Secretary of State in 1907. The latter authority has ruled that no hard and fast principles could be laid down and that each case should be decided on its merits.

(d) *Gokak storage and canal extension project.*—In December 1903, the Government of Bombay submitted for sanction plans and estimates amounting to Rs. 1,78,61,342 for this project which provided for the irrigation of 120,000 acres out of a total commanded area of 498,000 and was expected to earn a net revenue of Rs. 7,93,500, equivalent to a return of 4·4 per cent on the capital outlay. In August 1907, the plans and estimates were returned to the Bombay Government with an intimation that the project could not be finally disposed of pending receipt of the Secretary of State's orders on the general question of co operation of native states. This question is referred to in (c) above.

(e) *Pravâra river irrigation project*.—In August 1907, the Secretary of State sanctioned an estimate amounting to Rs. 86,14,841 for this project. It provides for the construction of a large masonry dam and storage reservoir at Bhandâra on the Pravâra river, and certain subsidiary modifications to the present Ojhar Right and Left Bank canals. The reservoir will contain about 8,700 millions of cubic feet of water, and will feed the above two canal systems, which have a length of 80 miles of main channel and of nearly 200 miles of distributaries. The scheme is designed to protect the Ahmednagar district which has been in the past peculiarly liable to famine.

Despatch to Secretary of State, No. 20-P. W., dated 23rd May 1907.
Despatch from Secretary of State, No. 38-P. W., dated 9th August 1907.

The total area commanded is 228,720 acres, of which 182,976 are culturable. The area expected to be irrigated annually is 49,410 acres yielding ultimately a net revenue of Rs. 2,23,205, which is equivalent to a return of 2.58 per cent on the total capital outlay.

(f) *Chankapur storage reservoir project*.—In December 1908, the Secretary of State sanctioned a revised estimate amounting to Rs. 17,69,596 for this project, which is situated in the Nâsik district, and consists of a dam 140 feet

Despatch to Secretary of State, No. 33-P. W., dated 29th October 1908.
Despatch from Secretary of State, No. 58-P. W., dated 4th December 1908.

in height which will impound 1,624 million cubic feet of water, and a canal taking off from the left bank of the Girna river. It is expected to irrigate 11,901 acres and to yield a net revenue of Rs. 69,035, equivalent to a return of 3.90 per cent on the capital outlay.

(g) *Protective irrigation surveys in Khandesh and Gujarat*.—The Government of Bombay in January 1908, submitted two estimates, amounting to Rs. 50,936 and Rs. 1,15,429, for the survey of the Tapti river valley in Khandesh and Nâsik and a contour survey of Gujarat district, respectively, for the investigation of the possibilities of irrigation. It was stated that the result of the surveys in the Deccan had been to show that the areas which could be irrigated there were far larger than was anticipated by the Irrigation Commission, and that a survey in Gujarât and Khandesh would probably have a similar result. In reply the local Government were informed that before sanction could be given to the outlay, the Government of India would be glad to have the proposals further examined as they felt some hesitation as to whether there was a sufficiently strong case for incurring so considerable an expenditure. During the course of the same year the local Government resubmitted the two estimates with a recommendation that they should be sanctioned. In reply, the Government of Bombay were informed that in view of the inadequacy of funds under "35—Protective Irrigation Works" the inception of any comprehensive scheme for Gujarât, if it was to be financed from the head "35", should be postponed until the more important Deccan projects were completed or at least far advanced. If, however, the Governor in Council should still be anxious to proceed with the survey, the Government of India had no alternative but to suggest that the expenditure should be met from the head "43—Minor Works and Navigation".

A reply on somewhat similar terms was sent regarding the estimate for the survey of the Tapti river valley.

6. **Madras Presidency.**—(a) *Bhavanasi tank.*—In March 1906, the Government of India sanctioned an estimate for this work amounting to Rs. 1,12,200. The tank will be formed by throwing a bund across the Bhavanasi, a jungle stream near Pedda Jangalapalli in Ongole taluk, Nellore district. It is designed to irrigate 841 acres annually, and to yield a net revenue of Rs. 3,592, representing a return of 2·53 per cent on the total capital outlay.

(b) *Gazuladinne reservoir project.*—This scheme provides for the construction of a reservoir on the Hendri River, and its necessary subsidiary works. The reservoir is designed to provide water sufficient to irrigate an area of 11,958 acres, and the project is expected to earn a net revenue of Rs. 29,170, or a return of 2·18 per cent on the capital outlay of Rs. 13,33,000. The scheme was however deferred pending settlement of the Tungabhâdra case.

(c) *Tungabhâdra project.*—This project was received from the Madras Government during the Viceroyalty of Lord Curzon. It was examined on the spot by the Inspector General of Irrigation in March 1906 and returned to the Madras Government for amendment in accordance with the Inspector General's recommendations. The project aimed at affording a large measure of protection against famine in the Deccan districts, Bellary, Anantapur, Kurnool and Cuddapah, with some productive rice cultivation in Nellore. The head reservoir in the Tungabhâdra river was to have submerged 128 sq. miles of country, of which 57½ were situated in Hyderabad territory, the total capacity being 120,683 million cubic feet. The main canal alignment was unavoidably located for the first 23 miles in an exceedingly difficult rocky country, involving the construction of a tunnel two miles in length. Apart from this reach of 23 miles, several costly rock cuttings were to have been undertaken but the only really difficult work was the Someswâram Dam. A very large portion of the area to be protected was composed of black cotton soil for which canal water would not be used in years of ordinary rainfall; this led to some uncertainty in estimating the revenue likely to be realized from the proposed canal. The estimated cost of the project, as submitted, was Rs. 12,18,77,000, with a probable return of something over 2 per cent, but the whole scheme, both in matters of expenditure and revenue, had to be carefully revised.

In October 1909, the Government of Madras submitted rough estimates which showed that, excluding the Nellore portion, the scheme would cost some 13 crores of rupees in execution and would yield a net revenue of about 2·59 per cent on that capital outlay. The Madras Government had come to the conclusion that, without interference with the more profitable schemes for the construction of the Cauvery and Kistna reservoirs, which are now in course of investigation, the Tungabhâdra project could not be commenced for many years to come and that any further estimates which might be prepared for the project would be entirely out of date long before there was any chance of the work being carried out. They accordingly advised that the scheme should be indefinitely postponed, but that the several smaller schemes intended to irrigate areas within the scope of the Tungabhâdra project, which had been held over pending a decision on the latter, should now be revived. In reply the Government of India agreed to the proposal.

(d) *Protective works surveys, Madras Presidency.*—From 1905-06 a Superintending Engineer with a suitable staff continued to be employed on the

surveys of irrigation works. The protective works, 23 in number, have been roughly estimated to cost about five crores of rupees, and to protect an area of about 600,000 acres; the return on the capital expenditure varying from 1.5 to 4.95 per cent. Some of these works promise to be remunerative, in which case they will be classed as productive. Six have been roughly estimated to cost about 27 lakhs of rupees, commanding an area of approximately 50,000 acres, with a return on the capital cost of over 5 per cent.

(e) *Mopad and Rallapud reservoir projects*.—Estimates amounting to Rs. 12,10,500 and Rs. 17,73,000, respectively, for these two projects were submitted by the Government of Madras in June 1906, but were returned with the suggestion that it seemed preferable to abandon the Rallapud project and to extend the Mopad project to include the area which it was proposed to irrigate from the former.

(f) *Venkatapuram tank project*.—In February 1908, the Government of India sanctioned an estimate amounting to Rs. 2,58,500 for enlarging the capacity of the present minor tank of Venkatapuram in the Ramanakot taluk of the Kurnool district, by diverting into it the Dhone Vagu or stream which flows in the vicinity. The project will serve a portion of the Ramanakot taluk which is extremely liable to famine; it will command an area of 1,705 acres and yield a revenue of Rs. 9,471. Towards the close of 1908, and before work on the project was started, it was discovered that owing to certain unforeseen works the estimate would be exceeded. A revised estimate was therefore submitted amounting to Rs. 3,46,600 (including all charges) and was sanctioned by the Government of India in February 1908.

(g) *Kistna reservoir project*.—In September 1906, the Government of Madras submitted plans and an estimate amounting to 9.63 crores of rupees for the Kistna Reservoir project. The scheme contemplated the construction of a masonry dam 228 feet high across the Kistna at a point 90 miles above the Bezwada anicut in order to form a reservoir with a capacity of 184,000 millions of cubic feet. The reservoir was to be connected with a canal some 95 miles in length, and the project was designed to irrigate an area of 1,270,920 acres, bringing in a net revenue of Rs. 49,24,610, equivalent to 5.11 per cent on the capital outlay. The Government of India found themselves unable to accept the project, considering it probable that the cost had been seriously under-estimated and that, in consequence, the financial aspect of the scheme would be materially altered. They accordingly replied, in June 1907, that the project as designed could neither be justified as a protective work nor recommended to the Secretary of State; at the same time they forwarded a note by the Inspector-General of Irrigation suggesting an alternative project, the main feature of which was the realignment of the route of the main channel so as to avoid the difficulties of the line originally proposed. This alternative scheme promised to be more economical than the one advanced by the Government of Madras but, like the original, it was essentially protective in character. In suggesting that a preliminary investigation of it should be undertaken, the Government of India took occasion to remind the local Government that funds for protective works were limited and that it would be many years before the scheme could be financed. The local Government were therefore advised to consider the feasibility of reducing the scope of the scheme so as to bring it within the definition of a productive work.

In October 1907, the Madras Government replied, admitting that the original scheme must be abandoned on account of its excessive cost, but pointing out that, after examination by a subordinate officer specially deputed for that purpose, the alternative proposals of the Inspector-General of Irrigation appeared to be impracticable. They accordingly advanced a revised scheme for the construction of a comparatively low reservoir with a high level canal supplied by pumping power, and strongly recommended a more detailed investigation of this project which held out every prospect of satisfying the conditions of a productive work. The Government of India replied to the effect that they entertained some doubt as to whether the investigations of the alternative alignment suggested by them in 1907 had been carried out with the thoroughness that the importance of the question demanded, and that it was advisable that the scheme should be re-investigated before it was abandoned in favour of another project. The Government of India added that every reasonable effort should be made finally to set at rest all possible doubts in this matter, and they suggested that a competent officer should be deputed to carry out more completely the investigations recommended in 1907. The scheme is still under investigation, and there is reason to believe that it will satisfy productive conditions.

PRODUCTIVE WORKS.

7. North-West Frontier Province.—(a) Upper Swât river canal.—In March 1906, the Secretary of State sanctioned an estimate for Rs. 1,82,40,248, the calculated cost of this work. The need for extending irrigation in the Peshawar valley has long been recognised, and schemes have been examined from time to time with the object of enlarging and extending the existing Swât River canal, and for utilizing the waters of the Indus for irrigating the *Kadir* lands in the Swâbi tahsil. The Upper Swât project will supersede these schemes, and will afford water to large areas of fertile land now uncultivated owing to deficient rainfall.

The canal as designed is an exceedingly bold project involving the construction of large works in tribal territory, and a very large amount of tunnelling. The total area commanded is 448,895 acres, of which it is anticipated that 85 per cent or 381,562 acres will be annually irrigated. It is estimated to yield a revenue of Rs. 14,58,057, representing a return of 7.99 per cent on the total capital cost. The scheme will also be politically advantageous in quieting the restless trans-frontier tribes. The tribesmen at first exhibited a somewhat unfriendly attitude towards the work, which was attributed partly to a desire to be given a larger share in its construction, to the exclusion of the lower paid Punjâbi labourers, and partly to the circumstance that according to the original alignment the canal would pass through some Mahomedan graveyards. To surmount the last-named objection, a revised alignment was selected and approved by the Government of India. A force of khassadars to guard the canal workmen has been entertained at an annual cost of about half a lakh of rupees and it has been arranged that the charge should be borne by the Political and Irrigation Departments in equal proportions. The work has since been progressing satisfactorily.

(b) *Lower Swât river canal*.—This canal was, with effect from the 1st April 1906, and with the sanction of the Secretary of State, classified as a Productive

Despatch No. 21-P. W., dated 31st May 1906, to Secretary of State.

Despatch No. 46-P. W., dated 13th July 1906, from Secretary of State.

work as, from 1892-93, it had been consistently earning between 5 and 11 per

cent on capital outlay, and had fulfilled all the conditions of a productive public work. It was originally, in 1876, sanctioned as a productive work, but owing to the small returns anticipated a few years later it was placed under the class of "Famine Relief Protective Works."

(c) *Pahârpur canal*.—An estimate amounting to Rs. 7,25,000 for the construction of the Pahârpur inundation canal in the Dera Ismâil Khan district was sanctioned by the Secretary of State in 1905. The canal was expected to irrigate an area of about 41,600 acres. Owing to certain alterations in the project, which the local Administration considered necessary, the estimate was raised in 1908 to Rs. 9,88,282 and sanctioned by the Government of India. The anticipated revenue (Rs. 509,85) then represented a return of 5·06 per cent, instead of 7·03 as originally forecasted. A proposal to colonize the waste lands commanded by this project, about 10,000 acres in extent, by Mahsuds from beyond the border is now under consideration for political reasons. This idea, if carried out, will affect the financial results of the project unfavourably and probably render it an unremunerative work.

8. Punjab.—(a) *Central canal workshops at Amritsar*.—In March 1906 the Government of India sanctioned an estimated expenditure of Rs. 1,26,900 for the purpose of completing the equipment of the Amritsar shops. This expenditure was necessitated by the active prosecution of the Triple canals scheme which has largely increased the demands on the workshops and rendered it necessary to improve their efficiency. Sanction was accorded later to a revised estimate amounting to Rs. 1,85,358 for bringing the equipment of the shops up to date, and for replacing worn out tools; also to an estimate of Rs. 79,822 for the construction of a new machine shop. Both estimates are chargeable to the open capital account of the Bari Doab Canal. In April 1910, the Government of India also accorded sanction to the acquisition of 8·57 acres of land required for a new siding in connection with the new machine shop, with additional land for storage and to provide spoil for filling old tanks within the area concerned.

(b) *Utilization of the Sutlej river waters*.—In May 1908, the Government of India sanctioned an estimate amounting to Rs. 2,14,165 of the cost of surveys, etc., required for the preparation of a complete project for utilizing the cold weather supplies of the Sutlej and Beas rivers for the irrigation of British territory and the territories of the Bikanir and Bahâwalpur States in the Sutlej valley. This project, in its entirety, is a very large and important one, and if it proves as satisfactory as is anticipated it will be the next large irrigation work to be commenced in the Punjab. The cost of the work if eventually carried out will be shared between the British Government, and the Darbars concerned. A revised estimate of the cost of the surveys and preliminary investigations, amounting to Rs. 2,68,813, was sanctioned in July 1910.

(c) *Dhingana canal project*.—In June 1906, the Government of India sanctioned an estimate, amounting to Rs. 8,86,111, including indirect charges,

for this project chargeable to the open capital account of the Indus Inundation canals. The scheme consists in remodelling and amalgamating certain irrigation channels in the Dera Gāzi Khan district. It will, it is anticipated, add 18,180 acres of new irrigation to an area of 57,571 acres already irrigated, and yield a net revenue of Rs. 56,383, which represents 6·36 per cent. on the capital outlay.

(d) *Remodelling and extension of Niāz Beg distributary, Upper Bari Doab canal.*—In July 1907, the Government of India sanctioned an estimate amounting to Rs. 2,55,336 for remodelling and extending the Niāz Beg distributary of the Lahore Branch, Upper Bari Doab Canal, chargeable to the open capital account of that canal, the work being classed as remunerative. The additional area which will be brought under irrigation by the project is estimated at 21,163 acres and it is anticipated that a net revenue will be earned of Rs. 61,373, equivalent to 24 per cent on the capital outlay.

(e) *Waterlogged land in certain tracts in the Punjab.*—The tract in the neighbourhood of Amritsar, served by the Upper Bari Doab canal, has now so high a spring level that the fertility of the soil and the health of the people are endangered. The question of lowering the spring level by irrigating the land by means of water drawn from the sub-soil was therefore brought to the notice of the Punjab Government. In September 1907, the local Government proposed to institute experiments as to the rates of infiltration of spring water into large open tanks or drains, to determine whether these would answer as effectively as the more costly brick wells. The Government of India, while approving of the proposal, suggested that, failing good results from infiltration trenches, endeavours might be made to devise comparatively cheap wells. They also suggested the trial of electric pumps in villages possessing a large number of wells.

The extent to which spring level has risen in the tract served by the Lower Jhelum canal has recently attracted the attention of the supreme Government. The Punjab Government has been asked to report what measures can be taken to remedy the evil.

(f) *Triple canals project.*—A full description of this project was given in paragraph (g), pages 8 and 9 of the Summary of the Administration of Lord Curzon of Kedleston. The original estimates for the three canals were sanctioned by the Secretary of State in his telegram, dated the 17th January 1905. The estimates amounted to—

				Rs.
Upper Jhelum canal	...	...	...	2,99,25,294
Upper Chenab canal	...	...	...	3,00,11,157
Lower Bari Doab canal	...	...	...	1,83,02,474
		Total	...	<u>7,82,38,925</u>

In 1909 the Punjab Government reported that the estimate would be exceeded by the large sum of 212 lakhs of rupees. The most serious excess was in the provision made for the river and hill torrent works of the Upper Jhelum Canal. Another contributing cause was the phenomenal increase in the rates for labour which, owing to the decimation of the population by plague, had risen in the few years following the preparation of the estimates by about 33 per cent. Deviations in the original designs also accounted in some degree for the

excess. An immediate report was made to the Secretary of State pending the submission of the revised estimates which were received from the Punjab Government in the spring of 1910 and are now under consideration. The estimates have now amounted to the large total of Rs. 1,037 lakhs, the increase over the originals being Rs. 255 lakhs or 32·5 per cent. The revised project has been drawn up on the assumption that the original forecast of revenue will be realised, and, on this assumption, the percentage of return on the capital cost will fall from 9·97 to 7·5.

The project in its original form contemplated the construction of a syphon under the river Ravi to convey the water from the Upper Chenab canal to the Lower Bari Doab system which is practically a continuation of the former. It was considered at the time that a syphon would be the most suitable and economical device to employ for this purpose. The work, estimated to cost some 30 lakhs of rupees, was of paramount importance seeing that the whole supply of the Lower Bari Doab canal and an estimated annual revenue of 38 lakhs of rupees would depend on its efficiency. It was, moreover, the first work of the kind, of any magnitude, to be constructed in India, and the design had been the subject of much anxious consideration. The opinions of the Inspector General of Irrigation and of the several other engineers who were concerned with the problem, being at variance as to the form of syphon to be adopted, it was decided to ask the Secretary of State to submit the matter to the judgment of a committee of selected experts at home. A committee presided over by Colonel Sir John Ottley was duly appointed to consider the case, and Messrs. Benton and Mullaly (Inspector General of Irrigation, and Chief Engineer, Irrigation, Punjab, respectively) who happened to be at home on leave at the time, gave evidence before them. None of the designs suggested by the Indian engineers was however accepted, and the committee advocated the adoption of an improved and more

Despatch No. 47-P.W., dated 19th November 1909,
from Secretary of State.

expensive type of syphon the cost of which
was estimated at nearly 50 lakhs of rupees.

On his return from England the Inspector General took advantage of his tour in the Punjab to examine the committee's report with the aid of the survey plans available in Lahore and to discuss all its bearings with the local irrigation officers. After full consideration he recommended that the idea of constructing a syphon should be abandoned in favour of a level crossing which, he reported, presented no unusual difficulty and exactly corresponded to similar works built in connection with all modern canals of importance.

The difficulties originally anticipated in connection with a level crossing, were, then found to be not so serious as at first thought, and after consultation with the Punjab Government it was decided to adopt this form of crossing, and to proceed with the designs for the work in anticipation of the sanction of the

Despatch to Secretary of State No. 10 P. W., dated
18th March 1910.

Despatch from Secretary of State No. 11-P.W.,
dated 22nd April 1910.

Secretary of State, which was obtained in
April last. An estimate for this work
amounting to Rs. 22,68,228 has recently

been received and is under consideration in connection with the revised estimates for the Triple project as a whole.

(g) *Incidence of the cost of rectangular and soil surveys on the Upper Chenab and the Lower Bari Doab canals.*—In December 1903 the Government of India came to learn that the Government of the Punjab had decided to charge the cost of rectangular and soil surveys of the areas commanded by

the Upper Chenab and Lower Bâri Doâb canals, respectively, to those projects. Heretofore the cost of such operations had been met by the cultivators and the Government of India took exception to the local Government's action which debited the projects with expenditure they were not intended to bear and which introduced a new procedure. After some correspondence it was finally decided, in June 1910, that the Irrigation Department should not bear the cost of these surveys except such portion of the cost of rectangular survey of proprietary lands as represented the amount of work which would otherwise have fallen on the Irrigation Department in connection with the alignment of distributaries and water courses. The local Government now proposes to re-transfer the incidence to the settlers and recommends that the expenditure should remain temporarily at debit of the Triple canals project pending its recovery. This point is now engaging the Government of India's attention.

(h) *Khânki Weir, Lower Chenab canal.*—The bed of the Chenab river below the weir of these important head works has risen in level of recent years, the under-sluices cannot therefore clear the silt which collects in front of the canal regulator and prevent it from entering the canal, and it has been found necessary to sanction an estimate amounting to Rs. 1,72,055, for constructing two contracting spurs below the weir and another for Rs. 3,08,460 for a subsidiary regulator for the canal. The importance of completing these works without delay is being impressed on the local Government.

(i) *Distribution of canal water by modules or meters.*—Proposals were made by Mr. Kennedy, late Chief Engineer for Irrigation in the Punjab, for the use of a module invented by him, at the heads of distributing channels. The invention has been fully considered and found to be open to some objections. Some experiments are, however, being made in the Punjab and a report on the subject is awaited.

9. **Bombay Presidency.**—(a) *Choi Branch canal.*—In March 1906, an estimate amounting to Rs. 2,94,914 for the construction of this canal was sanctioned. The work commands the land to the east of the railway between the Sind and Begâri canals, and is designed to supply water to a tract where the need of irrigation has been keenly felt. The total culturable area commanded is 67,880 acres and it is expected that 33,940 acres will be annually irrigated. This canal is expected to yield a net revenue of Rs. 25,843, equivalent to 8·76 per cent. on the capital outlay.

(b) *Improvement of the existing inundation canals and provision of perennial irrigation in Sind.*—In December 1903, with reference to a resolution of the local Government showing the action taken for improving the system of distribution of water delivered by the existing inundation canals in Sind, the Government of India informed the Government of Bombay that they were of opinion that improvements should be carried out freely and early in parts never likely to be provided with perennial irrigation, while caution would have to be exercised regarding expenditure of money in those tracts likely to receive it at no distant date. The local Government were also informed what surveys and investigations should be undertaken with a view to the construction of weirs and canals for the provision of perennial irrigation.

(c) *The Sind projects.*—Very few of the Sind canals carry water in the cold weather. They are canals without weirs of the inundation type, and when the winter supply of the Indus river has been still further reduced,

owing to the large canals in the Punjab under construction or likely to be constructed in the near future, the discharges of the Sind canals at the commencement and at the end of the irrigation season may be seriously affected.

It is therefore contemplated to convert the existing inundation into perennial systems. The proposal is to divide the Indus in Sind into three lengths, with three weirs near Mithankote, at Sukkur, and probably somewhere near Kotri, with the necessary canals taking out above them. Of these sites, the Sukkur is the most important, and this portion of the total scheme has first engaged attention. The barrage at Sukkur will serve three great canal systems known as the Right and Left Bank canals and the Eastern Nara. The project for this large work, the cost of the barrage alone of which may amount to 150 lakhs of rupees, has been under preparation for the past three years, and is now far advanced. The cost of the total project has been roughly estimated at 10 crores of rupees, and its ultimate area of irrigation at $3\frac{1}{2}$ million acres with an annual revenue of 87 lakhs. The project is expected to prove amply productive, and if it answers expectations it will be the first of the large Sind works to be undertaken.

The Mithankote project will probably be the next to follow, the site for the weir would be at a point not far from the confluence of the Indus and Chenab rivers, and the weir would permit of the irrigation of the southern part of Bahawalpur State, British territory as far south as Sukkur on both banks of the river, and possibly also a portion of Khelat territory. It is intended to examine this scheme when the Sukkur project has been fully dealt with.

The position for the third weir would be at Kotri or Jerruck, where there are facilities for the construction of such a work, and the canals off-taking from it would serve the deltaic tracts of Sind where great extensions of irrigation are feasible. The total cost of the three projects will probably amount to nearly 18 crores with a probable annual irrigation of over seven million acres, or more than double the present maximum irrigation of Sind, and the supplies of water would not be subject to the fluctuations and other defects of the inundation canals of the present time.

(d) *Eastern Nāra project*.—In February 1908, the Government of India sanctioned an estimate amounting to Rs. 81,479 for making a detailed survey and for preparing plans and estimates for a remodelling and extension of the Eastern Nāra chargeable to the open capital account of that project.

(e) *New regulator, Begari canal*.—In March 1908, the Government of India sanctioned estimates amounting to Rs. 2,48,887 for constructing a new regulator at the head of the Begari canal chargeable to the open capital account of that canal. This, and the Eastern Nāra project, are likely to be absorbed in the great Sukkur scheme above referred to.

(f) *Ghotki canal project*.—In October 1906, the Government of Bombay submitted an estimate amounting to Rs. 48,90,691 for the construction of this inundation canal which is intended to utilise the waters of the Indus to irrigate land situated in five *talukas* of the Sukkur collectorate in Sind. The canal is expected to irrigate 160,420 acres and to yield a net revenue of Rs. 204,502, which is equivalent to 4.18 per cent on the capital outlay. The project was returned to the local Government for consideration of certain suggestions.

(g) *Jamrao canal*.—During 1908-09 the Government of India sanctioned an estimate amounting to Rs. 88,989 for raising the water level in the Jamrao Canal regulator and in three of its minors, chargeable to the open capital account of that system.

(4) *Dál canal*.—This work was first sanctioned in 1895. A revised estimate amounting to Rs. 27,32,741 was subsequently sanctioned, and the construction estimate was closed on the 31st March 1907. Including works sanctioned, but not completed on that date, the total outlay on the project was Rs. 26,78,740 an amount somewhat below the sanctioned estimate.

(i) *Nasrat canal*.—This work was sanctioned in 1895 and the construction estimate closed on 31st March 1907. The sanctioned estimate amounted to Rs. 18,76,113 and including outlay on works sanctioned but not completed on that date, the total outlay was Rs. 19,91,918 or Rs. 1,15,805 in excess of the sanction. The approval of the Secretary of State to this excess was obtained early in 1910.

(j) *Mahiwah irrigation project*.—The original estimate for the Mahiwah project in the Rohri division of the Shikarpur district in Sind, which amounted to Rs. 10,66,340, of which Rs. 1,29,503, was on account of indirect charges, was sanctioned by the Secretary of State in September 1900. It was then recommended to the Secretary of State as a remunerative project, the anticipated revenue being Rs. 74,246, equal to a return of 6·96 per cent on the capital outlay.

Owing, however, to inadequate provision in the original estimate for regulators, road bridges, etc., it was subsequently found necessary to revise the estimate and after a correspondence extending over a considerable time, the Bombay Government submitted in 1903 a revised estimate amounting to Rs. 15,17,356, including indirect charges. According to the local Government's estimate the net revenue was put at Rs. 68,256 per annum, equivalent to a return of 4·5 per cent on the capital invested. This forecast was, however, based on the assumption that a water rate of Rs. 3 per acre would be realised. Taking the view that on past experience of the results of the Mahiwah in particular, and of other inundation systems in Sind in general, a water rate of not more than Rs. 2·8 would be obtained, the Government of India revised the project on that basis. According to the forecast, as so altered, the net revenue from the project ten years after completion would not be more than Rs. 34,450 per annum, equal to 2·27 per cent only on the capital outlay. In view of the expectations which were originally formed as to the remunerative possibilities of this project it was classed as a productive public work but according to the Government of India's forecast the canal failed to satisfy productive conditions. In submitting the revised estimate to the Secretary of State, they accordingly recommended that any expenditure incurred during 1908-09 on the project should be written back from the head "49—Irrigation works not charged to revenue" to the head "43—Minor Works and Navigation" and that the funds required in future years would be provided under the latter head.

The Bombay Government protested against this decision, and in consideration of the favourable results recently obtained by the canal, which had followed from an unexpected change in the supplies from the Indus floods—a change which had resulted in the irrigation of a much larger area than was anticipated—the Government of India recommended to the Secretary of State that the decision to charge further outlay on the work to revenue should be held in

Despatch No. 12-P. W., dated 17th March 1910, to Secretary of State.

Despatch from Secretary of State No. 12-P.W., dated 29th April 1910.

Despatch to Secretary of State No. 11-P.W., dated 6th May 1909.

Despatch from Secretary of State No. 20-P.W., dated 9th July 1910.

Despatch to Secretary of State No. 16-P.W., dated 31st March 1910.

Despatch from Secretary of State No. 20-P. W., dated 15th July 1910.

abeyance, but that it be imposed if further experience conclusively showed that the canal was not capable of satisfying the conditions of a productive public work. This proposal has been accepted by the Secretary of State.

(k) *Water supply scheme for the Poona and Kirkee cantonments*—In September 1906, the Government of Bombay submitted a comprehensive scheme for the supply of filtered water to the Poona and Kirkee cantonments as well as to the city of Poona. The supply was to be drawn from the Mutha canal and the scheme was estimated to cost Rs. 15,84,218. In February 1908, the local Government were informed that the Irrigation Department should not act as a distributing agency of *filtered* water, but that its duties should be confined to the supply of water in bulk at a reasonable rate at the canal outlet ; the whole expense of filtering and distributing the water and of providing the works necessary to render the scheme efficient being met by the local municipal and cantonment authorities. The local Government were accordingly asked to submit for the approval of the Government of India proposals regarding the rates to be charged for the supply of water in volume. The Bombay Government later on represented the difficulties attendant on the transfer of the management to a local authority as there were three such bodies interested in the waterworks. The Government of India, however, declined to reconsider their previous decision on the ground that it was no part of the functions of the Irrigation Department to supply filtered water and that the duty, being a purely municipal one, should be transferred to one or other of the local bodies concerned. The matter is still under the local Government's consideration.

Pending a decision on the question of transfer of management, the Government of India sanctioned two estimates amounting to Rs. 73,3-9 and Rs. 59,298, respectively, for providing a set of steam pumping machinery for the Poona water works, and an improved main connection with the Yeravda central prison, chargeable against the open capital account of the Mutha canals. But they have decided that no further capital outlay, having for its object the improvement of the efficiency of the filtration plant, should be incurred.

In July 1910 the Bombay Government reported that the Poncet wheel at the Poona pumping station interfered with the flow of water in the Mutha canal and prevented the full development of irrigation. It was accordingly recommended that the wheel should be replaced by two steam pumping engines at a cost of Rs. 41,116. This proposal is still under consideration.

(l) *Mutha canal*.—An estimate amounting to Rs. 1,00,002 for making a portion of the Mutha Right Bank canal water-tight was sanctioned in 1909, chargeable to the open capital account of the Mutha system. A scheme has since been prepared for the extension of those canals. The scheme was intended to take the place of a former project for the provision of two additional storage reservoirs at Panset and Warasgaon in the Bhore State, which was estimated to cost over 42½ lakhs and to bring in a net revenue of Rs. 2,73,500. The 1909 scheme involved the construction of an entirely new dam across Lake Fife, and of a new canal some 60 miles in length, while the cost of the proposed work, which would practically supersede the existing Mutha canal system, was estimated at the large sum of 1½ crores of rupees. Owing to the physical features of the country traversed, the Government of India apprehended that the scheme would have little chance of success. It seemed advisable, as the Bombay Govern-

ment had other irrigation works in prospect in the Deccan, with greater possibilities, which would occupy the energies of their engineers for some years to come, that those works should be given precedence over the Mutha project and that the Mutha project in the form advanced, if not definitely abandoned, should be postponed until very strong reasons for its revival could be advanced. The Bombay Government were accordingly informed to that effect in June 1909 and it was suggested that any other suitable alternative for obtaining the increased storage for the Mutha Canals might be considered.

(m) *Khelat canal*.—At the instance of the Government of India the Bombay Government submitted, in 1907, a preliminary report on the construction of a canal to irrigate lands in the Khelat State. The cost of the project was estimated to be approximately Rs. 195 lakhs including all charges, and the annual cultivation was put at 4,00,000 acres. It was anticipated that the project would yield a net revenue of Rs. 8,80,000, and would give a return of 4·5 per cent on the capital outlay. An examination of the project, however, showed that the scheme might cost even more than Rs. 195 lakhs and that it would probably yield a return of only 2·2 per cent on the capital outlay. It was further held that a perennial canal to irrigate the same area could be constructed at an approximate cost of Rs. 86½ lakhs and it was accordingly decided that the extension of irrigation to Khelat territory should be deferred until such time as perennial irrigation could be introduced.

(n) *Double embanking of the Indus river in Sind*.—The Government of Bombay in the year 1907 submitted for expert opinion the question of the alignment of embankments on the east of the Indus in Sind in addition to the embankments which at present exist on the western bank. This work was to afford additional security to the surrounding lands from inundation. The local authorities were decidedly in favour of the double embankments but the Government of India were of opinion that the measure would be a mistake and might lead to serious results. In January 1909, the Government of India again considered this question and brought its objections before the Government of Bombay for careful and serious consideration in view of the great issues involved, one of which is the safety of a portion of the North-Western Railway. The question is still under the consideration of the Bombay Government.

10. **Bengal**—*Tolly's nullah improvement scheme*.—Various schemes have been advanced from time to time by the local Government to admit of steamer and boat traffic being facilitated and improved in connection with the widening of Tolly's nullah and connecting distributaries. Owing, however, to the costly character of the schemes and the poor returns expected, it appeared very unlikely that the work would prove productive. In these circumstances, the local Government was informed in May 1909 that the Government of India were unable to finance the scheme from Imperial loan funds.

11. **United Provinces**.—(a) *Fatehpur Sikri distributary extension of the Agra canal*.—In March 1907 the Government of India sanctioned a revised estimate amounting to Rs. 8,63,068 for this project. The scheme contemplates the construction of 136½ miles of canals which will irrigate annually an area of 43,422 acres. The project aims at protecting from famine one of the most precarious tracts of the Agra district. The anticipated return on capital outlay is 11·8 per cent.

(b) *Sarda-Ganges-Jumna feeder scheme*.—In January 1909, approval was accorded to the preparation by the United Provinces Government of a detailed project for this scheme, which is of an unusually bold nature. Its object is to divert a portion of the waters of the Sarda river, situated in northern Oudh, into the Ganges upstream of the off-take of the Lower Ganges canal at Narora. This will be known as the Sarda-Ganges feeder. A portion of the Ganges water will be drawn from the Upper Ganges canal and passed into the Eastern Jumna system by means of a connecting canal known as the Ganges-Jumna feeder. This again will set free a large quantity of water in the higher reaches of the Jumna which it is proposed to utilize in developing irrigation in the Western Jumna tract of the Punjab. The work will thus benefit two provinces. Besides augmenting the supplies of the three canal systems mentioned above, the scheme will improve the efficiency of the Agra and Rohilkhand canals and permit of irrigation in the Moradabad and Budaon districts. The work may cost between 5 and 7 crores of rupees in execution, and preliminary estimates are now in course of preparation. Correspondence is also proceeding with the Governments of the United Provinces and the Punjab regarding the proportion in which the supplies should be divided between those provinces. It is hoped that the project will be productive.

(c) *Hathras Branch, Upper Ganges canal*.—In March 1909, the Government of India submitted, for the sanction of the Secretary of State, an estimate amounting to Rs. 17,72,189 for the construction of the Hathras branch. The

Despatch to Secretary of State No. 8-P. W., dated 18th March 1909.

Despatch from Secretary of State No. 21-P. W., dated 21st May 1909, *vide* Appendix.

proposed work is designed to serve portions of the Aligarh, Etah and Agra districts. The project is expected to irrigate 109,500 acres and to yield a net revenue of Rs. 2,53,685, equivalent to 14.31 per cent on the capital outlay. Sanction was accorded by the Secretary of State to this work in May 1909 chargeable against the open capital account of the Ganges canal.

12. Madras Presidency.—(a) *Godvari delta system*.—In May 1906, the Government of India sanctioned a revised estimate, amounting to Rs. 4,06,814, for constructing new under-sluices at the Dowlaishweram anicut, chargeable against the open capital account of the Godâvari delta system. The original estimate for this work, which had been sanctioned in 1903, amounted to Rs. 2,68,755.

(b) *Cauvery reservoir project*.—In June 1906, the Government of Madras submitted a revised estimate, amounting to Rs. 292 lakhs for the Cauvery reservoir project, the original estimate for which had been returned to the local Government for revision in January 1905. The project contemplates the construction of a large reservoir on the Cauvery river 5 miles north of Neringipet, and of the subsidiary channels to distribute the stored water. This reservoir is chiefly required for rendering the supply of water more assured to existing irrigation in the Cauvery delta and also for extending irrigation in the locality. The project has since been returned to the Madras Government for further revision in order to secure certain material improvements in the scheme. The project is still under investigation; its cost is likely to amount to about four crores of rupees and it is believed that the work will prove productive.

(c) *Appapuram drainage and irrigation schemes*.—In July 1907 the Government of India sanctioned estimates, amounting to Rs. 2,95,071, and Rs. 3,03,020, respectively, for the Appapuram drainage and irrigation schemes in the Madras Presidency, chargeable to the open capital account of the Kistna delta system, the works being classed as remunerative. The schemes were designed to bring under irrigation an area of 20,000 acres of land now submerged by floods. The net revenue is estimated at Rs. 70,000, equivalent to 11·7 per cent on the total capital outlay of Rs. 5,98,091. A revised estimate for the drainage scheme amounting to Rs. 3,48,565 was sanctioned in July 1910. The irrigation scheme has since been abandoned.

(d) *Chapad project*.—In October 1907, the Government of India sanctioned an estimate amounting to Rs. 5,97,705 for this project, chargeable to the open capital account of the Kurnool Cuddapah canal, and its amalgamation with that canal.

(e) *Siddapur tank project*.—In November 1907, the Government of India sanctioned an estimate amounting to Rs. 5,04,000 for this project in the Kurnool district. It provides for enlarging and improving an existing ruined tank on the Bhavanasi river, in the Nandikotkur taluk, Kurnool district. It is anticipated that an area of 4,250 acres will be irrigated annually bringing in a net revenue of Rs. 27,069, equivalent to a return of 5·37 per cent on the capital outlay. This work was originally classified as a productive work, but on the suggestion of the Madras Government it was recently transferred to the minor works category.

(f) *Divi pumping project*.—In 1905 the Secretary of State sanctioned an estimate amounting to Rs. 18,60,000 for this project. The scheme is designed to irrigate 50,000 acres of land in Divi island at the mouth of the Kistna river by raising water from the river by means of centrifugal pumps driven by Diesel oil engines. Steam or oil motor lift irrigation has not hitherto been attempted in India on any large scale and the Irrigation Commission recommended this scheme in the hope that it would be the precursor of other projects of the same description. For the distribution of water from the pumps, 35 miles of main channels, 42 miles of main and 70 miles of minor distributaries will be provided, making a total length of 147 miles of channel. During 1908-09 it was found that the cost had been somewhat under-estimated, and a revised estimate, amounting to Rs. 19,98,000, was sanctioned by the Government of India. The project is expected to be completed in 1911-12 and to pay a net annual revenue of Rs. 1,35,918, which is equivalent to a return of 6·8 per cent on the capital outlay.

(g) *Cauvery delta system*.—During 1908-09 the Government of India sanctioned a revised estimate amounting to Rs. 1,62,728, for improving the Palavar drainage, Cauvery delta system, chargeable to the open capital account of that system.

(h) *Nagavalli River project*.—In February 1905, the Secretary of State sanctioned an estimate, amounting to Rs. 10,82,000, for this project, which is designed to command 50,000 acres in the Palkonda taluk of the Vizagapatam district. It is anticipated it will irrigate 26,626 acres annually, on an average, and yield a net revenue of Rs. 87,314, equivalent to a return of 8·07 per cent. In February 1908, the local Government reported an anticipated excess of

about Rs. 7 lakhs over the original estimate, and on receipt of the revised estimate amounting to Rs. 20,74,000, including indirect charges, in December of the same year, it was found that the actual excess was Rs. 9,92,000. The amended project was expected to pay a net revenue of Rs. 1,00,114 representing a return of only 4·82 per cent on the capital invested. In April 1909, however the revised estimate was returned to the Madras Government for amendment in the light of certain remarks made by the Inspector-General of Irrigation, and the matter is still under consideration of the local Government.

13. Burma.—(a) *Shwebo canal.*—The original estimate, amounting to Rs. 48,04,093, for this canal was sanctioned by the Secretary of State in September 1900. The canal is situated in the Shwebo and Sagaing districts of Upper Burma where, owing to the uncertainty of the rainfall, the cultivation of rice is very precarious. The canal, according to the original project, was to have commanded a culturable area of 2,06,926 acres, of which 1,50,000 acres were to be annually irrigated. The return on capital expenditure was estimated at 8·7 per cent.

In May 1908, the Government of Burma, owing to an increase in the cost of construction and alteration of the alignments of certain distributaries, and certain extensions, submitted a revised estimate amounting to Rs. 54,84,198 for this canal. The project, as revised, will command a culturable area of 171,783 acres, of which 1,46,000 will be annually irrigated. The net revenue anticipated is Rs. 4,82,583 which is equivalent to a return of 8·8 per cent on the capital outlay. The revised estimate was submitted to the Secretary of State in

September 1908 and sanctioned by him in the following month.
Despatch to the Secretary of State, No. 21-P.W., dated the 3rd September 1908.
Despatch from the Secretary of State, No. 53-P.W., dated the 16th October 1908.

(b) *Mandalay canal.*—In December 1908, the Government of India sanctioned an estimate amounting to Rs. 82,268 for the extension of a branch of the Tamokso distributary from the Mandalay Canal, chargeable to the open capital account of that system. The extension was intended to open out 3,240 acres of land to irrigation and realise a net revenue of Rs. 11,664 which is equivalent to a return of a little over 14 per cent on the proposed outlay; but the scheme was abandoned in favour of the Kinbat distributary for which an estimate was submitted for Rs. 99,949 and sanctioned by the Government of India in October 1908.

The Mandalay canal, particulars of which were given in the summary of the administration of Lord Curzon, was completed at a cost of Rs. 51,25,228 or Rs. 21,003 in excess of the sanctioned estimate of Rs. 51,04,225. This excess was sanctioned by the Secretary of State in April 1909.

Despatch to the Secretary of State, No. 5-P.W., dated the 25th February 1909.

Despatch from the Secretary of State, No. 11-P.W., dated the 2nd April 1909.

(c) *Ye-u canal project.*—The original project which was sanctioned by the Secretary of State in June 1905, was expected eventually to irrigate an area of 54,000 acres, and to give a net return of 5·37 per cent on an outlay of Rs. 35,21,984, or of 4·97 per cent. on the sum-at-charge. This project was, however, prepared in some haste as it was urgent to decide whether the scheme was sufficiently promising to warrant the headworks being built in conjunction with those of the Shwebo Canal under construction at the time.

This question being settled the elaboration of the Ye-u scheme was undertaken in full detail and led to the preparation of a much more remunerative project. The revised estimate, amounting to Rs. 49,64,426, including indirect charges,

Despatch to Secretary of State No. 21-P. W., dated the 5th August 1900.

Despatch from Secretary of State No. 42-P. W., dated the 22nd October 1909.

was submitted to the Secretary of State for sanction in August 1909, which was accorded two months later. The present project will, it is anticipated, irrigate 115,760 acres and will give a return of 8.13 per cent on the estimated expenditure, or 8.06 per cent on the estimated sum-at-charge.

(d) *Món canals*.—In November 1908, the Government of Burma reported that the original estimate for this project, amounting to Rs. 43,99,372 including indirect charges, which had been sanctioned in the year 1902, would probably be exceeded by Rs. 9,41,753. A revised estimate is now awaited.

14. **Central Provinces.**—*Asola Mendha tank*.—This tank was sanctioned as a protective irrigation work in 1903 during the Viceroyalty of Lord Curzon. The area that the project was designed to protect was 20,000 acres and the return anticipated 3.23 per cent on the capital outlay of Rs. 6,18,301. In March 1910, the Central Provinces Administration submitted a revised estimate, amounting to Rs. 17,97,578. The revised project provides for the irrigation of an area three times as large as that originally contemplated, and for the construction of a system of 84 miles of distributaries against a mileage of 12 provided for in the initial scheme. The net revenue anticipated is Rs. 1,25,500 as compared with the original forecast of Rs. 20,000, and the estimated return on the capital outlay is now a little short of 7 per cent. The revised estimate for the project has been recommended for the sanction of the Secretary of State who has been asked to approve of its classification as a productive public work to be financed from loan funds. His Lordship's sanction is awaited.

Despatch to Secretary of State, No. 19-P.W., dated 11th August 1910.

15. *Classification of certain canal systems as productive public works*.—With effect from the 1st April 1907, the following canals were transferred from the head "43—Minor Works and Navigation" to the head "49—Irrigation Works not chargeable to Revenue."

Province.	Name of Canal.
Madras	Lower Coleroon anicut system. Shatlatope anicut system. Tirukkoyilur anicut system. Cheyaru " " Poiney " "
United Provinces	Bijnor and Dun.
North-West Frontier Province	Kabul river.

Despatch to the Secretary of State, No. 32-P. W., dated the 12th December 1907.

Despatch from the Secretary of State No. 7-P.W., dated the 14th February 1908.

MINOR WORKS.

16. Bengal—Magra Hat drainage project.—In 1907, an estimate, amounting to Rs. 20,10,857, for this

Despatch No. 1-P. W., dated the 24th January 1907, to Secretary of State.
Despatch No. 22-P. W., dated the 12th April 1907, from Secretary of State.

project was submitted to and duly sanctioned by the Secretary of State. The scheme is intended to improve the sanitary condition of a tract covering an area of about 290 square miles in the district of the 24-Perganas, and to relieve from water-logging a tract of land which is now both unhealthy and unfertile.

The local Government has made a contribution of five lakhs of rupees towards the cost, and has also undertaken that all maintenance charges shall be borne by Government in return for any income derivable from the scheme, and the balance of the cost of the scheme will be met by the District Board from a Government loan of Rs. 15,10,850, bearing interest at the rate of 4 per cent per annum and repayable in 30 years, but the expenditure will, in due course, be recovered from the proprietors of the tract affected.

17. Bombay Presidency.—Hullur tank project.—In 1907, the Government of Bombay submitted plans and estimates amounting to Rs. 8,23,195 for the completion of the Hullur tank in the Bijapur district when famine conditions next prevail in that district. The Government of India replied that they were reluctant at present to sanction the construction of the Hullur tank even as a famine relief work, as it might prove a perpetual source of expenditure in the future.

18. Baluchistan.—(a) Scheme for completion of Pakur Khan's karez.—The Government of India at one time approved of the development, into a minor irrigation work, of a *karez* (or water channel) commenced by a local chief of the name of Pakur Khan with the aid of various *takkavi* advances made to him by the State. On receipt, however, of the detailed estimates it became clear that the work had been done in a most unscientific manner and that it was undesirable to pursue it. The local Administration was accordingly informed that it should be definitely abandoned.

(b) Nar Nullah reservoir project.—In June 1908, the Government of India sanctioned a provisional estimate amounting to Rs. 7,22,104 for this project, asking the local Administration, at the same time, to amend the project on the lines indicated by them and to submit a fresh estimate. The project consists of a masonry dam of a capacity of 420 million cubic feet across the Nar nullah, near Quetta, which will impound the flood waters of the Hanna and Spin *Karez* valleys. The water will be utilised principally in the cantonment of Quetta, but a small proportion will be devoted to irrigation. The area expected to be irrigated annually is 4,680 acres. The final estimate has been sanctioned for a sum of Rs. 7,93,610, but no regular forecast statements having been drawn up, it is not yet possible to arrive at the probable return which may be expected from the project.

19. Burma.—(a) Henzada embankment.—The question of the extent to which the construction of embankments on the left bank of the Irrawaddy should be permitted, which had for many years past engaged the attention of the Government of Burma, became so pressing after the flood season of 1906, that it was

considered advisable to appoint a committee to investigate the subject. The report of the Committee having disclosed the probability of a very serious danger arising in the event of another very high flood occurring, the local Government submitted proposals concerning the measures to be taken to safeguard the Henzada embankment from danger during the flood season of 1907. These proposals were, in the main, accepted and certain additional precautionary measures which the Inspector-General of Irrigation had suggested were recommended for the consideration of the Burma Government.

One of the precautionary measures adopted for the safety of the Henzada embankment was the breaching of the Tharrawaw railway embankment on the opposite side of the Irrawaddy river, to allow the spill waters headed up against it to escape. The Burma Railways Company have now put forward a claim of Rs. 1,07,948 as compensation for the loss sustained by the cutting of the embankment. There is a difference of opinion between the Government engineers and the Railway authorities as to whether the railway embankment on the Tharrawaw line did, as Government maintain, affect the level of the Irrawaddy to an extent that imperilled the safety of the Henzada embankment. The question is at present under consideration.

(b) *Embankment and reclamation works.*—The existing works of this class appear to possess many advantages as they protect a considerable area of land and yield a large amount of revenue. The net assessed revenue on the Irrawaddy and Thongwa island embankments, during 1907-08 was Rs. 9,52,135, equivalent to a return of 27 per cent on the capital outlay of Rs. 35,13,826, and in the case of the other works for which only revenue accounts are kept, the net assessed revenue amounted to Rs. 4,29,724 in the same year. Burma has, however, been unable to add to works of this character on account of want of funds. The Government of India are prepared to apply loan funds for their advancement to the extent to which funds may be available from time to time, and to provincialise, or partly provincialise the works in order to give the Burma Government a direct financial interest in them. Under such an arrangement, the local Government would meet the interest and working expenses in whole or in part, and receive the whole or a corresponding share of the revenue. There are several tracts which could be reclaimed with advantage, and the matter is being given the consideration of the local Government.

(c) *Dredging plant for Twante canal project.*—The work for which this plant is primarily intended is described under the heading "Inland Navigation." The cost of the plant will be debited in the first instance to the head "43 Minor Works and Navigation," depreciation charges being debited to the particular works on which the dredgers are employed. In April last an estimate for the dredgers, amounting to about 27 lakhs, was received from the Burma Government. It has been returned for a revision of the specifications.

20. United Provinces.—*Sukhra Nadi scheme.*—In July 1909, the local Government submitted an estimate amounting to Rs. 1,96,518 for this scheme. The Sukhra Nadi is situated in the Mirzapur district and the scheme aims at protecting a tract which is subject to great distress in times of deficient rainfall. The project is expected to yield a net annual revenue of Rs. 9,337 representing a return of 4.75 per cent on the capital invested, and the local Government recommended that it should be treated as a productive work. As, however, the estimated cost of the scheme, including indirect charges, was less than two lakhs, the Government of India considered that it should be classed as a minor work

and sanctioned by the local Government as a project chargeable to the head—
“43—Minor Works and Navigation”—Provincial.

21. **Coorg.**—*Proposed anicut across the Harangi river.*—In September 1909, the Chief Commissioner of Coorg submitted an estimate amounting to Rs. 2,80,000 direct charges, for constructing an anicut across the Harangi river in north Coorg, and other incidental works. The Government of India were of opinion, however, that the estimate would be greatly exceeded owing to the work lying in a difficult tract, and the project was accordingly returned for revision.

INLAND NAVIGATION.

22. **Eastern Bengal and Assam.**—*Navigable waterways of India.*—In June 1907, the Government of Eastern Bengal and Assam drew the attention of the Government of India to the necessity of framing a comprehensive scheme for the improvement of the waterways of Eastern Bengal, urging the importance of developing as far as possible the natural facilities for transport afforded by the river system of the Province. At the same time the local Government said that, before embarking on any considerable expenditure upon any of the larger schemes for the improvement of the waterways, it was necessary that they should be fully considered and examined by expert engineers, but as the Province possessed no officer with the necessary professional training or experience, the Government of India were asked to sanction the employment of an expert. In reply, the Government of India said that the first step to take was to cause a preliminary report to be drawn up, indicating generally the scheme which it was proposed should be put in hand. As to the appointment of an investigating officer they deprecated the calling in of an outside expert at that juncture and suggested that the local Government should endeavour to train its own waterway engineers as other Provinces have had to do in similar cases. Eventually Mr. C. A. White, Superintending Engineer, was deputed to consider the question, the general line of investigation having previously been indicated by the Government of India. His report was received, but without any recommendation from the local Government, in the spring of 1910 and is now under consideration.

23. **Bengal and Eastern Bengal and Assam.**—*Madaripur Bhil route.*—In May 1908, the Government of India submitted for the sanction of the Secretary of State an estimate, amounting to Rs. 31,66,876, for improving the navigable route through the Madaripur Bhil. The object of this scheme was to convert what was known as the Madaripur Bhil route, which is navigable only between the middle of July and the middle of October in each year, into a perennial canal, so that it might be navigable to steamer and country-boat traffic all the year round. The work was commenced by the Bengal Government on estimates sanctioned from time to time against the open capital account of the Calcutta and Eastern canals system and with the improvements suggested, the total cost was Rs. 31,66,876. The Governments of Bengal and Eastern Bengal and Assam each agreed to share equally the expenditure proposed, *viz.*, Rs. 17,15,502, and to divide the net earnings in proportion to the capital which each had invested. The Bengal Government estimated the net receipts from tolls on traffic using the channel at Rs. 1,48,763 a year, which is equivalent to 4·70 per cent on the total capital outlay. The Secretary of State's sanction has been accorded.

Despatch No. 11-Public Works, dated 7th May 1908, to Secretary of State.

Despatch from the Secretary of State, No. 26-P. W., dated 26th June 1908.

21. Burma.—Twante canal.—Towards the end of 1908 the Government of Burma submitted a project for enlarging and improving the waterway comprising the Kanaungto creek, Twante canal and Twante creek, the estimated cost of which amounted to Rs. 31,50,000. The object of the expenditure was primarily to benefit trade by improving the navigation facilities of an important trade route and it was proposed to forego the recovery of a proportionate share of the cost from those who would directly benefit by the scheme. The work was proposed to be treated as a minor navigation work debitable to head "43" but owing to a depression in the provincial revenues, the Government of India were asked to advance the capital as a loan.

The project was returned in July 1909 for further consideration in the light of certain criticisms made thereon, with the remark that the estimate might be charged only with a fraction of the cost of the dredging plant required for the excavation work and, that, if sufficient revenue could be anticipated, the work should be treated as a productive public work, the balance of the cost of the dredgers being charged to "43". To give the province the benefit of the receipts the Government of India offered to provincialise the scheme on its completion. A revised estimate was received in April 1910, amounting to Rs. 71,60,973, inclusive of indirect charges and the previous recorded outlay of about three lakhs on the existing channels. About 27 lakhs of this represents the cost of the dredgers. The net revenue anticipated is Rs. 5,20,000 or a return of 7·3 per cent on the capital outlay. The project would on this basis fulfil the conditions of a productive work and the Government of India have decided to recommend it, as such, to the Secretary of State after receipt of certain further particulars regarding the revenue forecast which have been called for from the Government of Burma.

As regards the loan, the Government of India are prepared, with the approval of the Secretary of State, to advance such sum as may be required for the purchase of the dredgers subject to a maximum of Rs. 30 lakhs—the loan to bear interest at $3\frac{3}{4}$ per cent and to be repayable in ten years.

The local Government has accepted these terms but has proposed that the repayment should commence from the date of completion of the Twante canal improvement scheme (about 1915-16) in order that the increase to general revenues anticipated from that work may be utilised as far as possible to meet the debt. This proposal is now under the consideration of the Government of India.

COMMUNICATIONS.

25. Gomal river bridge on Murtaza-Wana road.—An estimate amounting to Rs. 1,01,911 for constructing a permanent bridge over the Gomal river beyond Murtaza was sanctioned in 1907 subject to criticism which was chiefly directed to the design of foundations and the allowance of waterway. The permanent bridge was urgently needed to replace a timber structure which was damaged beyond repair in 1906 and permission had been given to start work in anticipation of the preparation of the detailed design and estimate. The new works were damaged by floods and in the following year it was found necessary to sanction a fresh estimate amounting to Rs. 1,62,834. In doing so, the Government of India took occasion to point out several apparent defects in the design notably the want of bracing between the girders and adjacent trestles, and the insufficient waterway provided. The work was nearing completion but the local Administration was asked to give these points full consideration. In September 1910 a report was received that three spans of the new structure were washed away by a flood in the preceding July.

26. Roadway over the railway bridge at Nowshera.—In 1907 the Agent to the Governor-General and Chief Commissioner, North-West Frontier Province, recommended that tolls levied on the Nowshera boat bridge should be abolished and that the roadway over the railway bridge at that place should also be opened to the public free of tolls, the local Administration undertaking to meet the initial outlay of Rs. 6,200 required to cover the cost of quarters and installation of telegraph and block instruments as required by the North-Western Railway, and also to defray the recurring annual charge of Rs. 2,200 for keeping the roadway open. This proposal was accepted.

27. Kodigey bridge at Coorg.—The construction of a bridge across the Harangi river at Kodigey on the Fraserpet-Seringal road at a cost of Rs. 54,000 was approved in 1908.

28. Irish bridge at Ghata Billod, Central India.—In 1908 the Government of India approved of the substitution of an Irish bridge over the Chambal at Ghata Billod in place of the old structure which had been pronounced unsafe. It was decided that the cost, estimated at between Rs. 15,000 and Rs. 25,000, should be divided equally between the Government and the Gwalior Darbar, the latter executing the whole work and charging 12 per cent for establishment, tools and plant, for such portion of the work as would be debitable to Government.

29. High level Teesta valley road.—This route connects northern Bengal with Sikkim and Tibet and for the greater part of its length it follows the course of the Teesta river. Owing to damage repeatedly caused by river floods, the Government of Bengal, in 1905-06, sanctioned an estimate amounting to Rs. 8,68,830 (works only) for the realignment of the road from the 13th to the 29th miles. Owing, however, to increased rates on account of the scarcity of labour, to the execution of work not anticipated before actual construction began, and to the damage caused by heavy rainfall while the work was in progress, it was found that the estimate would be exceeded. A revised estimate

Despatch to Secretary of State, No. 33-P. W., dated 2nd December 1909.

Despatch from Secretary of State, No. 1-P. W., dated 21st January 1910.

amounting to Rs. 10,18,865 (works outlay) was accordingly received in October 1909 and submitted to the Secretary of State for sanction which was accorded in January 1910.

BUILDINGS.

30. Offices and quarters for the Viceregal staff at Calcutta.—The want of suitable accommodation for the Viceregal establishments at Calcutta had been felt for many years and, towards the end of Lord Curzon's Viceroyalty, it was decided to acquire certain properties in the immediate vicinity of Government House. These properties have been purchased and on the sites so acquired accommodation has been provided for the staff of His Excellency the Viceroy, the bandsmen, an office for the Private Secretary, stables, etc., at an aggregate cost of Rs. 20,44,883, inclusive of departmental charges. The buildings had all been treated as separate projects, but the Comptroller-General took the view that they should be regarded as component parts of a single scheme and, as such, requiring the Secretary of State's sanction, the cost being in excess of Rs. 10

* Despatch No. 29-P. W., dated 7th November 1907, to Secretary of State.

† Despatch No. 56-P. W., dated 27th December 1907, from Secretary of State.

lakhs. The facts* were reported to the Secretary of State who sanctioned† the expenditure, remarking that the case was one beyond the Government of India's financial competence to sanction.

Administrative approval was accorded in 1908-09 to certain additions and alterations to the new Viceregal stables and staff residences at Wellesley Place, Calcutta, at a cost of Rs. 21,076.

31. Alterations to the Council Chamber in Government House, Calcutta.—In consequence of the enlargement of the Imperial Legislative Council it has been proposed that a separate council chamber should be provided, and endeavours are now being made to obtain a suitable site. In the meantime, however, the Council will continue to assemble in the existing Council room in Government House, Calcutta, and in order to provide the necessary accommodation for the additional members it has been enlarged. The estimate sanctioned for the work, including electric fittings and furniture, amounted to Rs. 36,774. A revised estimate amounting to Rs. 38,735 has since been approved.

32. Viceregal estate buildings, Simla.—During the year 1908-09 several important structural alterations were carried out to Viceregal Lodge, Simla, including the provision of public entrée cloak rooms and an office for the Comptroller of the Household. The bungalow known as 'West End Hotel,' the quarters occupied by His Excellency's bandsmen, was pulled down and a new building erected on the site, at a cost of Rs. 44,115. It was also proposed to build new offices for the Private and Military Secretaries, and designs therefor were actually prepared by the Consulting Architect to the Government of India. Owing, however, to the unfavourable financial position the execution of these projects was indefinitely postponed.

33. "The Retreat," Mashobra.—This estate is situated in the vicinity of Simla and during the administration of Lord Elgin, was taken over on a perpetual lease, for the use of His Excellency the Viceroy, from the Rana of Koti to whom it belongs. Subsequent to the execution of the lease, the owners of certain adjoining properties claimed a right-of-way along a path traversing the estate and although the matter has been under discussion for a considerable time it has not yet been definitely set at rest. The Government of India do not admit the existence of any right-of-way, but to meet the convenience of the public they have constructed new roads, and improved existing communications, in the neighbourhood. The owner of two properties in the vicinity is not, however, prepared to relinquish his alleged rights and the Government of India have therefore decided to appoint an officer to enquire into the matter and to submit such recommendations as he may think proper. The general public will be given an opportunity of representing their views to the enquiring officer.

34. Rules for management of Viceregal estates.—In connection with the formation of the Viceregal estate division, revised rules were framed for their management. The new rules released the Military Secretary to His Excellency the Viceroy from the supervision of the local Public Works Department in many matters of petty detail. They conferred upon him final powers of sanction, subject to the existence of the necessary budget provision, in respect of works not involving important structural alterations and costing not more than Rs. 10,000 in each case, and full powers as regards ordinary repairs. A certain measure of independence was also conferred on the Superintendent, Viceregal estates. In respect of the local purchase of European stores and the acceptance of tenders, the revised rules gave the Military Secretary and the Superintendent, the ordinary powers of a Superintending and Executive Engineer respectively. The audit and accounts of the division were brought under the control of the Examiner of Public Works Accounts, Bengal. The Viceregal estates division has since been abolished and the estates at Simla and Mashobra, Calcutta and Barrackpore, have been placed respectively in charge

of two Assistant Engineers who are designated Superintendents. A revision of the rules for the management of the estates is at present under the consideration of the Government of India.

35. 'Snowdon', Simla.—'Snowdon,' the official residence at Simla of the Commander-in-Chief, was materially improved during the tenancy of Lord Kitchener, and the expenditure incurred thereon was so considerable that the Secretary of State decided to withdraw from the Government of India the power of sanctioning further capital outlay on the building. Sir O'Moore Creagh, the present Commander-in-Chief, nevertheless represented, on his assumption of office, that the house was in many respects ill-suited for the residence of a married Commander-in-Chief and he asked for additions and alterations estimated to cost about half a lakh of rupees. His Excellency also asked that he should be exempted from charges now levied in respect of 'Snowdon', *viz.*, house rent, rent for furniture and electric installation, and municipal taxes. The Government of India were not prepared to consider alterations to the extent asked for, but they recognised that occasional demands for further improvements would be made, especially on the entry of a new tenant, and that they should be met to a reasonable extent without unnecessary delay. They have accordingly asked the Secretary of State to empower them to sanction structural alterations to "Snowdon" to the extent of Rs. 10,000 immediately, and Rs. 5,000 on every future change of incumbency. His Excellency's request to be allowed to occupy the building free of all charges has not been supported, but the Government of India have recommended that, in accordance with the arrangement in force in case of the residences of ordinary members of the Governor-General's Council, the Commander-in-Chief should be exempt from the payment of owner's taxes. The Secretary of State's orders are awaited. The Government of India have also agreed to supplement the equipment of the house by additional furniture costing Rs. 13,100; and they are arranging for the preparation of a project for the improvement of the electrical installation. The annual grant for the repair of the building has, with effect from the year 1911, been raised from Rs. 4,000 to Rs. 5,000.

36. Proposed civil secretariat building on the Kennedy House site, at Simla.—Owing to the expansion of the departments of the Government of India Secretariat and the pressing need, since 1905, for more office accommodation at Simla for certain imperial departments and various subordinate offices, which are at present located in hired buildings, it was proposed to construct a new secretariat building on the Kennedy House site. Although according to the approximate forecast, which put the cost at about 7 lakhs, the project was within the powers of sanction of the Government of India, it was decided to

Despatch to Secretary of State, No. 31-P. W., dated 29th October 1908. inform the Secretary of State of this

proposal, as he was assured in 1903 that, on the completion of the Gorton Castle secretariat, all the offices would be adequately housed. The Secretary of State, however, directed that the building operations should be suspended pending a reconsideration of the requirements of the Army offices. The

Telegram from Secretary of State dated 22nd December 1908.

Despatch to Secretary of State, No. 3-P. W., dated 27th January 1910.

The Government of India have decided to abandon the original project, as the Army offices have withdrawn their demand for additional accommodation, and the Secretary of State was so informed early in

1910. The requirements of the Civil secretariats are, however, now being considered afresh.

37. Commerce and Industry Department secretariat building in Council House Street, Calcutta.—On the formation of the new Department of Commerce and Industry and the transfer of the railway portion of the Public Works Department to the control of the Railway Board during Lord Curzon's

Despatch to Secretary of State, No. 15 P. W., dated the 28th March 1907

Telegram from Secretary of State, dated 26th April 1907

Despatch to Secretary of State, No. 19 P. W., dated 23rd July 1908.

Viceroyalty, it was decided to erect a new secretariat building at Calcutta.

Accordingly in March 1907, the Secretary of State was asked to sanction a proposed expenditure of Rs. 18,40,908, including departmental charges, based on plinth area rates, on the construction of this building. He however declined to sanction the proposal, until the detailed estimates were ready. These were prepared and amounted to Rs. 20,81,612 which outlay was duly sanctioned by His Lordship in August 1908. Work on the building is well advanced and it will be ready for occupation by the middle of 1911.

38. New Presidency jail, Calcutta.—The old jail on the Calcutta *maidan* has long ceased to satisfy modern requirements, and the prominent position which it occupies on the *maidan* has been the subject of adverse comments by the general public of the city for many years. Accordingly, in 1903, it was decided to remove the jail to a more suitable spot at Alipore, the necessity for this course having been accentuated by an undertaking given by the Lieutenant-Governor

Despatch to Secretary of State, No. 7-P. W., dated 14th February 1907.

Despatch from Secretary of State, No. 23-P. W., dated 19th April 1907.

to make over the site for the purposes of the Victoria Memorial Hall. Estimates for the new jail at Alipore, amounting to Rs. 19,84,153 (inclusive of departmental

charges) were duly submitted to, and sanctioned by, the Secretary of State in 1907.

In 1910 the local Government submitted a supplementary project amounting to Rs. 5,20,822, inclusive of departmental charges, for the construction of a press building in connection with the new jail. It was the original intention of the Bengal Government to treat this requirement otherwise than as an adjunct of the jail. The local Government has, however, since decided that the press building ought to be regarded as an essential

Despatch No 22-P. W., dated the 8th September 1910.

part of the new jail. The Government of India have accepted this view and

have submitted the estimate for the sanction of the Secretary of State.

39. Dhurromtollah Press buildings, Calcutta.—The existing buildings have been found unsuitable for the purposes of a press, and it has been considered necessary to reconstruct them. Administrative approval to the project was granted in 1908, and the detailed estimates amounting to Rs. 6,65,270 which include provision for a complete equipment of electric lights and fans, were duly sanctioned early in 1910.

40. Belvedere, the residence of His Honour the Lieutenant-Governor of Bengal.—In 1906, administrative approval was accorded to certain additions and alterations to this residence at an estimated cost of two lakhs of rupees. The principal additions consist of a Durbar Hall or Ball room and a supper room, the necessity for both of which had long been felt. The detailed estimate which was subsequently sanctioned by the Government of India amounted to Rs. 2,09,032.

41. Extension of the Calcutta Museum.—At the instance of Lord Curzon, a scheme was initiated for structural alterations to, and re-arrangement of exhibits in, the Indian Museum, Calcutta. In 1904, the Government of India made a special grant of 5 lakhs of rupees from imperial revenues in furtherance of the scheme. Subsequently, however, the grant was enhanced to a maximum amount of Rs. 7,43,000. Some time has been occupied in settling the preliminaries and the sum now at the disposal of the Trustees, including interest that has accrued in the meanwhile, amounts to some 8½ lakhs. Early in 1910, the Bengal Government submitted a detailed estimate amounting to Rs. 8,33,881 for the alterations which consist of a three storied annexe on the site of the old Art Gallery and improvements to the upper portion of the existing building. The design of the upper story of the annexe, including the pediment, has been condemned on architectural grounds and the Government of Bengal has been asked to cause the work to be re-designed by its own Architect. In the meanwhile, to avoid further delay in the execution of the work, provisional sanction has been accorded to the estimate.

42. Quarters for gazetted officers permanently located in Calcutta—This scheme, which has for its object the relief of Government officials from the high rentals prevailing at Calcutta, was submitted for the Secretary of State's sanction in August 1906. The proposal contemplated the construction of 80 residences or sets of quarters for gazetted officers permanently stationed in Calcutta whose salary was not less than Rs. 500, or more than Rs. 2,500, a month, and whose families were residing with them. The quarters were to be rented at 10 per cent of the officer's salary, in the case of civilians, and at the maxima prescribed by military rules in the case of military officers. Pending the construction of quarters, relief was to be given to officers of the eligible classes in the form of house-rent allowances. The Secretary of State while sanctioning the proposals (in December 1906) considered that the building scheme should be undertaken by instalments only, so that the experience gathered from the residences first built might be utilised to determine whether the scheme fulfilled the expectations of the Government of India in regard to financial results and whether it was acceptable to the officers concerned in respect of the conditions of occupation, the accommodation provided, and other matters. His Lordship accordingly asked to be furnished with estimates for the construction of one fourth of the proposed residences. The Secretary of State also asked that after three years' experience of the working of the scheme, a report dealing with the whole subject should be submitted to him. On receipt of the Secretary of State's orders the Bengal Government was asked to submit proposals as to the types of residences to be constructed, the officers by whom they were to be occupied in the first instance, and the sites it was proposed to utilize. The local Government's proposals were received in July 1907. The designs submitted by the Bengal Government were not approved by the Government of India who caused their Consulting Architect to prepare fresh designs. After some correspondence, the Consulting Architect's designs were accepted by the local Government and detailed estimates have recently been received and are now under the consideration of the Government of India. The scheme contemplates the provision of accommodation for all but the most senior officials, on the flat system.

43. Removal of the Civil Engineering College from Sibpur and its reconstruction at Ranchi.—The unhealthiness of Sibpur and its unsuitability in other respects for educational purposes induced the Government of

Bengal to recommend the transfer of the Engineering College thence to Ranchi. The Government of India, in 1907, approved generally of the lines on which it was proposed to carry out the scheme, but reserved detailed discussion of the subject until detailed plans and estimates were received. The Consulting Architect to the Government of India is now engaged in the preparation of the necessary plans.

44. Central Lunatic Asylum for natives at Ranchi.—Administrative approval to this work at an estimated cost of Rs. 18,20,000 was accorded by the Government of India towards the end of 1907. The detailed estimates were not received until September 1909 and amounted to nearly Rs. 25 lakhs. It was, however, stated by the Bengal Government that owing to the condition of the Provincial finances it would not be possible to undertake the work for some time to come. The local Government has, therefore, been asked to resubmit the project when there is a fair prospect of its being carried into execution.

45. Accommodation for officials in Burdwan.—The Government of India, in February 1908, approved of a scheme for providing accommodation for certain Government officials at Burdwan, at a cost of Rs. 1,13,563.

46. Government House, Dacca.—The establishment of the head-quarters of the province of Eastern Bengal and Assam at Dacca necessitated the construction of a Government House at that station. A design for the building, prepared by Mr. Thornton, F.R.I.B.A., Architect to Messrs. Martin and Company, Calcutta, was submitted by the local Government and accepted by the Government of India. The estimate, amounting to Rs. 7,59,970, was sanctioned in November 1907.

47. Government House at Chittagong.—In 1907, the necessity for a suitable residence for the Lieutenant-Governor at Chittagong, a post assuming some importance, was recognised, and the Government of India sanctioned the construction of a Government House there at an estimated cost of Rs. 1,59,898 on designs prepared by the Consulting Architect to the Government of India.

48. Dacca secretariat building.—The creation of the province of Eastern Bengal and Assam necessitated the provision of office accommodation for the secretariat and other departments of Government at Dacca, the permanent head-quarters of the province. Accordingly the Secretary of State was asked to sanction an estimate, amounting to Rs. 16,90,157, for the building after a design prepared by the Consulting Architect to the Government of India. Sanction was communicated by telegram in December 1908.

49. Permanent and temporary buildings at Dacca.—In connection with the scheme for the establishment of the head-quarters of the Government of Eastern Bengal and Assam at Dacca, the Secretary of State was informed that the expenditure on permanent buildings at that place would be about Rs. 10 lakhs and that on temporary buildings, Rs. 1,85,000. His Lordship was subsequently told that the outlay would amount to Rs. 49,76,465 and Rs. 2,59,000, respectively. The estimates for the several buildings were being treated individually and were dealt with by the local Government or the Government of India under their respective sanctioning powers. The audit officer, however, took exception to this procedure on the ground that all the buildings com-

prised one project and that the outlay in excess of the limits originally reported to the Secretary of State required the specific sanction of that authority. The matter was referred to the Secretary of State, who upheld the audit officer's view. In doing so, he conveyed formal sanction to expenditure within the higher limits mentioned above, remarking that his sanction should be obtained to any outlay in excess of those amounts. Subsequently a revised estimate amounting to Rs. 3,00,000 for the temporary buildings was submitted to the Secretary of State who sanctioned it in March 1910. As regards permanent buildings the Government of Eastern Bengal and Assam was asked to submit an abstract of the cost of the buildings forming part of the general scheme. This information is now awaited.

50. Dacca College project.—This project was originated by the Government of Bengal and administratively approved at a cost of Rs. 6,34,000. Subsequent estimates sanctioned by that Government brought the figure to Rs. 9,23,145, and, after the formation of the new province, the Government of Eastern Bengal and Assam sanctioned a series of additional estimates with the result that the aggregate of all the estimates sanctioned and proposed amounted to Rs. 14,30,865, inclusive of departmental charges. As most of the work was nearing completion it was decided to dispense with the usual detailed estimates but the local Government was asked in January 1910 to submit an abstract of

Despatch No. 5-P.W., dated 3rd February 1910 to Secretary of State. cost based on detailed estimates, so that the recommendations might be duly forwarded to the Secretary of State, and to submit an explanation as to why the necessity of a reference to the Secretary of State was not foreseen earlier. In the meanwhile, a report has been submitted for His Lordship's information.

51. Arts College and School of Engineering, Dacca.—During 1907-1908, the construction of residences at a cost of Rs. 1,40,134 for the staff of the Arts College and School of Engineering at Dacca was sanctioned, the Government of India, however, commenting on the lack of architectural harmony which the scheme disclosed.

52. Residences for Government officials both at Dacca and Shillong.—In June 1909, the Government of Eastern Bengal and Assam submitted a proposal for providing houses both at Dacca and Shillong for Secretaries to Government and certain heads of departments. The Government of India after giving the matter due consideration sanctioned the proposal in so far as it related to secretaries but were unable to agree to heads of departments being provided with Government quarters at both capitals, as these officers were expected to be on tour during the greater portion of the year.

53. Government House at Shillong.—The woodwork in Government House, Shillong, constructed in the year 1900-01, having shown signs of decay, it was considered necessary to carry out extensive repairs, and accordingly an estimate, amounting to Rs. 67,955 for special repairs, was sanctioned in August 1907.

54. Ballroom at Government House, Lucknow.—The necessity for the provision of a suitable ballroom at Government House, Lucknow, had long been felt, and the Consulting Architect to the Government of India, after having personally visited Lucknow in January 1907, prepared a plan, which,

with a few modifications, was accepted by the Lieutenant-Governor of the United Provinces. In August 1907, the project was sanctioned by the Government of India at an estimated cost of Rs. 1,32,099.

55. Medical College and Hospital at Lucknow.—The establishment of a local institution capable of affording education in the higher branches of medical science had long been a cherished aim of the people of the United Provinces, and the want of such an institution was noticed by the Commission which was appointed during the Viceroyalty of Lord Curzon to enquire into the condition of the universities in this country. During the visit to India of His Majesty the King, then Prince of Wales, the Talukdars of Oudh and other influential members of the public approached the Government with a proposal that a medical college should be founded to commemorate His Royal Highness's presence at Lucknow, offering to raise public subscriptions towards the cost of the institution. The proposal was warmly seconded by the then Lieutenant-Governor. The original idea was that the college should be built mainly from such contributions and that the State should undertake liability for its maintenance. The proposal was placed before the Secretary of State who conveyed sanction to it in his telegram of the 5th December 1905, and the ceremony of laying the foundation stone was performed by His Royal Highness the Prince of Wales on the 26th December 1905.

It was at first proposed to construct the college near a private institution known as the Balrampur Hospital and to make use of the latter for purposes of practical instruction. Subsequently, however, it was found that this proposal was impracticable partly because the Balrampur Hospital was not constructed in accordance with modern requirements and was not capable of improvement owing to the cramped nature of the site, and partly because the land available in the neighbourhood was not sufficient for all the buildings required in connection with the college. The Lieutenant-Governor, moreover, considered it a matter of reproach that the important city of Lucknow should have to rely largely for its chief hospital on the charity of an individual. It was therefore considered essential that a thoroughly up-to-date hospital should be established both to supply efficient medical help to the people of Lucknow, and to serve as an institution in which the students of the medical college would receive their practical training. In respect of position, it was decided to construct the buildings on the Shah Mina site which is a large expanse of open ground adjoining the city. The design of the buildings was entrusted to Colonel Sir Swinton Jacob. Detailed plans and estimates, the latter amounting to Rs. 37,49,909, exclusive of departmental charges, were submitted by the Government of the United Provinces in March 1908. On examining the project it was found that the proposals were conceived on unnecessarily lavish lines and that there was much in the estimate which was of a rough and approximate character. Moreover, it was considered that the project was not prepared with care and in such detail as to minimise the possibility of an excess occurring over the estimated amount. For these reasons the plans and estimates were returned to the local Government for revision.

In January 1910, the local Government submitted the revised project, amounting to Rs. 32,69,950, of which Rs. 27,32,131 represented the works outlay. Including equipment, the cost of the college and the hospital is now put at Rs.

Despatch No. 11-P. W., dated 17th March 1910,
to Secretary of State
Despatch No. 15-P. W., dated 10th June 1910,
from the Secretary of State.

12,71,451 and Rs. 17,67,220 respectively. The annual cost of maintenance is estimated at Rs. 3,08,500. As regards the financing of the project the cost of the college portion of the scheme will be entirely covered by subscriptions and the annual interest accruing thereon. The initial cost of the hospital, and the recurring expenditure on the scheme as a whole will be a state liability. The revised project was submitted to the Secretary of State in March 1910 and has since been sanctioned by His Lordship.

56. Circuit House at Dehra Dun.—An expenditure of Rs. 53,855 on the purchase of two houses at Dehra Dun and their adaptation to the purposes of a Circuit House was sanctioned in 1908.

57. Rent-free occupation by indigent widows of certain buildings at Chunar.—In order to give effect to a scheme initiated by Sir James La Touche to provide accommodation for indigent widows of Government servants, the United Provinces Government in 1908 recommended that two cottages built from Government funds and an old Military Works building at Chunar should be set aside for the purpose, by treating them as provincial charitable institutions, and the repair grants from provincial funds being regarded as a donation for charitable purposes. These proposals were accepted.

58. Currency Office at Cawnpore.—The transfer of the currency office from Allahabad to Cawnpore necessitated the construction of a currency building at the latter place. Accordingly an estimate amounting to Rs. 2,84,000 including provision for electric fittings was sanctioned in October 1905. The building has since been completed at a cost of Rs. 3,58,317 including the cost of an adjacent site acquired for the erection of quarters at a future date.

59. Monotype Press building, Simla.—The Monotype Press was on its establishment accommodated in the old bullock train office at Simla. The building was, however, entirely unsuitable and work was carried out at considerable inconvenience. It was decided in 1906 to construct a new building. A rough estimate amounting to Rs. 67,501 for the building, including quarters for the Manager was accordingly sanctioned in 1907. Later in the same year the Government of India sanctioned the detailed estimate for the buildings, amounting Rs. 61,208. The work has since been completed at a cost of Rs. 64,268.

60. Acquisition of properties at Simla.—The house known as 'Ava Lodge' has been acquired by Government for Rs. 45,000 for the use of a Secretary or other senior official. It is now occupied by a Member of the Railway Board. The Government have also purchased "Holcombe" for Rs. 35,000 for a similar purpose. 'Constantia' having been acquired by the Young Women's Christian Association, the Meteorological Department, which occupied that building for many years, has been housed in "The Yarrows," which was bought for Rs. 60,000. Subsequent to the acquisition of these properties the question of providing houses for Secretaries at Simla was taken up by the Government of India. After some inter-departmental discussion it was decided to drop the question but the general trend of opinion was in favour of a policy of acquiring good and suitable houses as they fell into the market, at reasonable prices.

61. Quarters for Government of India clerks at Simla.—This scheme originated out of the recommendations of the Simla Allowance Committee

and was mentioned in the despatch to the Secretary of State dealing with the recommendations made by that body. The Secretary of State approved of the scheme but he decided that it should be proceeded with cautiously and called for estimates for a portion of the quarters. Plans of the proposed types of quarters were then drawn up and the Punjab Government was asked to prepare the necessary estimates. These were submitted in due course but, after further deliberation, the Government of India have decided not to embark on any general scheme for the provision of quarters for their clerical establishments, but to construct as an experimental measure a few cottages in the first instance with the object of arriving at the most suitable designs, and more correctly estimating the cost of the comprehensive scheme, if hereafter it should be decided to proceed with it. In this connection, the Sophia Ville estate, which seemed suitable for the purpose, was purchased in March 1910 for Rs. 78,000.

62. Office of the Accountant General, Lahore.—This office was formerly accommodated in an old Mahomedan tomb with additions made from time to time to meet the increasing requirements of the office. It was, however, ill-ventilated and badly lighted and the medical authorities condemned it on sanitary grounds. An estimate amounting to Rs. 2,76,092 for a new building, was sanctioned by the Government of India in March 1906. The work is now approaching completion and it is anticipated that the total cost of the project (including subsidiary buildings) will be Rs. 3,22,153.

63. New General Hospital at Rangoon.—The old buildings comprising the Rangoon General Hospital being inadequate and unsuited to modern requirements, it was considered necessary to construct a new hospital and the scheme, estimated to cost Rs. 32,81,693, was submitted to the Secretary of State in July 1904 during the viceroyalty of Lord Curzon. It received sanction in September of the same year. In executing the work deviations of an important character were introduced at the instance of the local medical authorities, but without reference to the Government of India. The result was that, by the year 1908, it was discovered that the cost would amount to Rs. 48,74,930, a sum about 50 per cent in excess of the total of the original estimate. In submitting the revised estimate to the Secretary of State for sanction, the Government of India commented on the irregular procedure followed by the local authorities and remarked that the explanation tendered by the Burma Government was not satisfactory and that a further explanation would be called for.

Despatch to Secretary of State, No. 17-P.W., dated 14th July 1904.
Despatch from Secretary of State No. 44-P.W., dated 2nd September 1904.

Despatch to Secretary of State, No. 10 P.W., dated 30th April 1908.
Despatch from Secretary of State, No. 37-P.W., dated 24th July 1908.

In communicating his sanction to the revised estimate, the Secretary of State commented on the financial irregularity and the lack of efficient control which had resulted in the excess outlay, and asked that the further explanation, when received from the Burma Government, should be communicated to him. This explanation has been received by the Government of India but action on it has been postponed pending receipt of an official report on a development of the case in the shape of a claim by the contractor for compensation for delays.

64. Quarters for Government officials at Rangoon.—This scheme owes its inception to the same causes which have brought about the Calcutta housing scheme, *viz.*, the dearth of suitable dwelling houses and the increasing rentals. The scheme as submitted by the Burma Government, in October 1907, contemplated the provision of 85 detached houses and the utilization of 87½ acres of available ground for the purpose. After some correspondence

with the local Government the following maximum limits of cost per quarter have been accepted by the Government of India.

Type of Quarters.						Cost per unit.
						Rs.
A. Class	...	...	...	...	...	37,000
B. „	...	...	...	...	...	23,579
C. „	...	...	...	...	...	20,560

The Government of India have asked the local Government to draw up revised plans of the types of dwellings which it is proposed to build, and that the drawings should be forwarded in the rough to the Consulting Architect for any criticisms he may have to make, and subsequently submitted accompanied by detailed estimates and a plan showing the arrangement of the houses on the site.

65. New Telegraph office, Rangoon.—The site for this building was purchased in February 1909 for the sum of Rs. 3,12,225. The Consulting Architect is now engaged on the preparation of the design.

66. Burma rent assessment system.—Under the rent rules embodied in the Public Works Department Code it is permissible for purposes of assessment to group together in one list all buildings from which an adequate rent return is expected.

In January 1909 the Government of Burma issued a circular clubbing together all the Class I provincial civil buildings (not affected by any special rules or conditions) to form one group, and assessing rent thereon at a uniform rate of $7\frac{3}{4}$ per cent of the salary of the occupant, irrespective of the style of construction or the accommodation provided. Certain officers of the Burma Commission who were occupying Government quarters memorialized the Government of India protesting against the orders issued and asking that they may be reconsidered. The Government of India while admitting that the principle underlying the rules was in itself sound, considered that some modification in points of detail was desirable with the object of mitigating the effect of the change on the more senior officials. They suggested either (a) that a graduated scale of percentage on salary should be substituted for the uniform charge of $7\frac{3}{4}$ per cent on salary, or (b) that if the fixed percentage system were maintained, the higher rent, where the increase was considerable, should be imposed not all at once but gradually over a series of years. The Burma Government replied in March 1910 to the effect that it preferred to adhere to the system of a uniform percentage on salary but to grant liberal concessions to officers adversely affected during the transition stage. The local Government proposed in such cases to adopt what was practically the suggestion described against (b) above by raising the rents by yearly increments of Rs. 10 per mensem on the former assessments, with retrospective effect. It was estimated that this concession would result in an aggregate loss of about half a lakh of rupees which it was proposed to make good by raising the assessments temporarily from $7\frac{3}{4}$ per cent to 8 per cent. The Government of India accepted the proposed arrangement as a reasonable solution of the difficulty underlying the original scheme, and the Burma Government was in July 1910 asked to inform the memorialists that the Government of India saw no reason to make any further modification of the local Government's orders.

67. Gwalior Residency building.—The old Residency building at Gwalior, which was constructed in 1868, was found to be inadequate and unsuited to present-day requirements and, as the structure was not capable of modification, it was decided, in 1908, to demolish it and reconstruct it on modern lines. The

new building was designed by the Consulting Architect to the Government of India, and an estimate, amounting to Rs. 92,362 (works outlay), has been sanctioned. The work will be executed by the Gwalior Darbar on behalf of the Government of India.

68. New Daly College at Indore.—In August 1907, the Agent to the Governor-General for Central India submitted a revised estimate for this project amounting to Rs. 10½ lakhs. The work was to be carried out as a contribution work, the Government liability towards the initial expenditure being, for the present, limited to Rs. 6½ lakhs, subject to a further grant of Rs. 1½ lakhs for the extension of the building if, after three years, the present accommodation proves insufficient to meet the demands of the College. The estimate was sanctioned in November of the same year.

69. Indore Residency.—This building, which was originally constructed to serve as a Durbar Hall, was reported by the Agent to the Governor-General as deficient in accommodation, and the Consulting Architect to the Government of India was directed to deal with the matter. The design adopted provided for the addition of a double-storeyed wing, and, in April 1907, an estimate for the project, amounting to Rs. 1,21,841, was sanctioned by the Government of India. Subsequently, in September 1908, the Government of India sanctioned a revised estimate amounting to Rs. 1,22,463 for the work.

70. Mayo College Annexe, Ajmer.—This project was the outcome of a conference of Native Chiefs and officials which was held at Ajmer in the year 1904 to consider certain reforms in connection with the Chiefs' Colleges. One of the questions discussed was the provision of additional buildings for the Mayo College at Ajmer. The original estimate for an annexe to the main building was received in 1905. The amount, Rs. 2,25,124, was considered extravagant and the estimate was returned to the Agent to the Governor-General for revision. At the same time the Government of India agreed to be responsible for such part of the cost, subject to a maximum of Rs. 2 lakhs, as might not be covered by subscriptions. Subsequently, in January 1906, a design estimated to cost Rs. 1,98,347 was accepted. This estimate, however, proved to be too low. The net expenditure was found to be Rs. 2,36,335 and the Government of India were asked to increase their promised contribution by Rs. 36,335. This request was, however, refused and in April 1909, the local Administration resubmitted the revised estimate for sanction and stated that the additional expenditure beyond the sum of 2 lakhs already sanctioned for the work would be met from College funds. Sanction was accorded on that understanding.

71. Government House, Ootacamund.—As a result of the recommendations of a Committee appointed by the Government of Madras to examine the method of expenditure on Government Houses in the Presidency, that Government in January 1907 submitted estimates amounting to Rs. 1,43,841 for additions and improvements to Government House, Ootacamund, which was reported to be in a very unsatisfactory state. The Government of India, however, disallowed certain items and limited the expenditure to a sum of Rs. 1,00,000.

72. New prison at Andheri, Bombay.—In September 1909, the Bombay Government submitted plans and an estimate amounting to Rs. 15,35,426 for the construction of a new prison at Andheri, in the vicinity of Bombay, stating that further estimates, aggregating Rs. 1,73,200, in respect of certain subsidiary works would follow. The Government of India returned the estimate in February last with the remark that it was impossible to submit the scheme,

in the form presented, to the Secretary of State, and the Government of Bombay were asked to submit a report giving full information as to the necessity for the work and to supply detailed estimates in respect of this project as a whole. These particulars are still awaited.

73. Circuit houses at Belgaum and Ahmedabad—Sanction was granted to the construction of circuit houses at Belgaum and Ahmedabad at a cost not exceeding Rs. 35,000 in each case.

74. Quarters for certain officers at Bombay.—In April 1909 the Government of India sanctioned the construction of a three-storeyed set of flats, at an estimated cost of Rs. 1,03,572 in Marine Lines, Bombay. The new flats are intended to provide accommodation for the Deputy Commissioner of Police, the Health Officer of the port of Bombay and one other officer, possibly the Presidency Executive Engineer.

75. Bushire buildings—Residency.—Plans and estimates for a new Residency were first submitted by the Bombay Government in 1905. The Government of India were however unable to accept the proposals as they stood, and a fresh design was prepared by Mr. Ransome, their Consulting Architect. The estimate for a building after Mr. Ransome's design was received in 1907, but the cost, Rs. 2,54,521, being still considerably in excess of the amount they were prepared to sanction, the Government of India returned it for further revision. The amended estimate which was submitted in July 1909 amounts to Rs. 2,21,227 and is still under consideration.

Assistant Resident's quarters.—In 1907, the Bombay Government submitted an estimate amounting to Rs. 1,12,521 for constructing a house for the First Assistant Resident at Bushire. This estimate was considered inordinately high and was returned for revision. A fresh estimate, amounting to Rs. 98,829 was received in the year following, but the Government of India were still of opinion that it had been framed on unnecessarily extravagant lines and was susceptible of further reduction. The building was re-designed by the Consulting Architect to the Government of India and the Bombay Government were asked to supply another estimate, and if possible to limit the cost to Rs. 60,000. The detailed estimate has been received and is under consideration.

76. New civil buildings, Peshawar.—In connection with the scheme for the interchange of sites and buildings between the civil and military authorities at Peshawar the Government of India, in September 1908, sanctioned estimates amounting to Rs. 39,073 and Rs. 33,512 for constructing a Deputy Commissioner's Court and a new Treasury, respectively. Revised estimates amounting to Rs. 45,510 and Rs. 40,359, respectively, were sanctioned in 1909.

77. Guest House at Peshawar.—In 1908 the Agent to the Governor-General, North-West Frontier Province, submitted a proposal for the construction of a guest house in the compound of Government House, Peshawar, at an estimated cost of Rs. 65,328. He represented that the existing accommodation afforded no room for guests and that a separate guest house was badly needed. The proposal was administratively approved early in 1909 and in the course of the same year the detailed project, amounting to Rs. 63,344, was received. The Government of India were, however, unable to entertain the proposal at the time owing to the unsatisfactory financial condition.

The project has since been resubmitted but in a different form, the cost being now estimated at Rs. 79,508. The original proposals comprised the construction of a guest house at some distance from the main building with a connecting covered passage. The revised scheme provides for the construction

of two guest houses immediately adjacent to Government House, certain additions and alterations to Government House, and the construction of a Darbar Hall or Ball room. The project is now under the consideration of the Government of India.

78. New Postal Audit Office at Nagpur.—Administrative approval was accorded in 1906 to the construction of a new Postal audit office at Nagpur to accommodate 535 clerks at an estimated cost of 3½ lakhs. Owing to certain administrative changes that have since occurred, it was decided to construct a smaller building with a capacity for 300 clerks. A design for such a building was prepared by the Consulting Architect to the Government of India and forwarded to the local Administration. The detailed estimate is now awaited.

79. New jail for the cantonment of Secunderabad.—The existing jail at Secunderabad is defective in point both of construction and of situation and its capacity is insufficient for present requirements. Accordingly, in 1906, the Resident at Hyderabad submitted plans and estimate for a new jail at a cost of Rs. 3,45,000. The necessity for a new jail was accepted by the Government of India but as the scheme did not meet the local requirements with regard to the general principles laid down by the Jail Committee of 1889, and was also open to serious objections from a technical point of view, the plans and estimates were in November 1908, returned for revision. The revised estimate amounting to Rs. 2,61,684 was received in July 1910 and is under consideration.

80. Circuit houses and residences of Heads of Administrations.—Heretofore the powers of local Governments and Administrations in the matter of expenditure on circuit houses was limited to Rs. 30,000 on account of original construction and to Rs. 1,000 for extensions and improvements; in the case of residences of Heads of Provinces and Administrations, the outlay was restricted to Rs. 15,000 in any one year. Beyond these limits the sanction of the Government of India was necessary. The restrictions were imposed to prevent undue expenditure, but taking the view that the effect of this arrangement was to throw on the supreme Government a responsibility which should properly vest in the local Government or Administration concerned, the Government of India decided, in August 1908, to withdraw the restrictions and to empower Heads of Provinces and Administrations to sanction outlay on these buildings up to the same limit that applies to other classes of buildings. The later action in this matter is described in paragraph 139 relating to decentralisation.

81. Basis of estimating outlay admissible on residential buildings for Government officials.—The salary of an official is the accepted criterion for determining the outlay that should ordinarily be incurred in providing him, when necessary, with an official residence. No general definition of the term 'salary' in the case of appointments carrying progressive pay, had been definitely laid down and in 1909 it was decided that the limit of cost should, in all cases, be based on the average salary of the class of official who would usually occupy the building. This ruling does not apply to Civil or Agency Surgeons in whose case it has been decided to adopt certain specified rates of pay.

82. Upkeep of electrical installations in Government residential buildings.—In April 1909 the Government of India decided that, on and from the 1st of that month and subject to revision at the end of three years from that date, the charge on account of "repairs" to electrical installations in Government residential buildings should be assessed at the rate of 8 per cent per annum on the capital cost. The total charge leviable from the tenant, inclusive of interest, but exclusive of cost of energy, is now 11½%. . Formerly

the charges imposed consisted of $8\frac{1}{2}\%$ for depreciation, $3\frac{1}{2}\%$ for interest plus actual working expenses.

83. Installation of electric lights and fans at Government House, Guindy (Madras).—The installation of electric lights and fans in Government House, Guindy, at an estimated cost of Rs. 60,000, was approved by the Government of India in June 1906.

84. Installation of electric lights and fans at Government House, Malabar Point, Bombay.—During 1908-09 sanction was accorded to the installation of electric lights and fans at Government House, Malabar Point, Bombay, at a cost of Rs. 76,270.

85. Installation of electric lights at Government House, Ganeshkind, Bombay.—In January 1910, the Government of India approved of the erection of an installation of electric lights at Government House, Ganeshkind, Bombay. The expenditure, which was estimated at Rs. 1,20,000, was within that Government's financial competence to sanction but the approval of the supreme Government was asked for as it was anticipated that the maintenance charges would necessitate an addition to the contract grant of His Excellency the Governor. The Government of India, in replying, pointed out some apparent extravagances, and said that they were unable to give any undertaking that His Excellency's contract grant would be enhanced on account of this scheme.

86. Electrical installation at the Quetta Residency.—Sanction was accorded to the provision of an electric installation at the Quetta Residency at a cost of Rs. 28,185 on account of which the Agent to the Governor-General, Baluchistan, will pay an annual rental of Rs. 1,000. The Government of India have since learnt that the cost of the work will be Rs. 31,950.

87. Installation of electric light and fans at the Indore Residency.—The installation of a new electric generating plant at the Indore Residency at an initial capital cost of Rs. 20,610, and a recurring charge of Rs. 5,730, was sanctioned during the year 1908-09.

88. Churches for troops.—During the period under review the following churches have been sanctioned and completed :—

Church.						Amount of sanctioned estimate.
						Rs.
PRESBYTERIAN.	Umballa	...	...	...	...	45,080
	Peshawar	...	...	...	...	60,906
	Rawalpindi	...	...	...	...	78,059
	Ranikhet	...	...	...	...	20,410
	Chakrata	...	...	...	...	21,562
	Sialkote	...	...	...	...	27,669
	Lucknow	...	...	...	...	57,698
UNCONGREGATED.	Cherat	...	...	...	...	45,261
	Ghariaf	...	...	...	...	61,577
	Chaubattia	...	...	...	...	44,417
	Lebong	...	...	...	...	49,972
	Jalapahar	...	...	...	...	36,981
R. C. Church, Dalhousie						28,543

The detailed estimate for a new Anglican Church at Lucknow, the construction of which was approved some years ago, is still under the consideration of the Government of India.

The construction of an unconsecrated church at Dalhousie has been approved, but the case has been held in abeyance pending the settlement of the question of site and the seating capacity of the church in respect of which fresh proposals are being advanced by the Bishop of Lahore.

The Government of India have also sanctioned the construction of an unconsecrated church at Maymyo and a design prepared by the Consulting Architect to the Government of India has been forwarded to the Burma Government for approval and preparation of an estimate.

In addition to the above, sanction has been accorded to the construction of a Railway Church at Lahore at an estimated cost of Rs. 49,909 inclusive of the expenditure to be incurred in connection with site, but exclusive of the cost of other subsidiary items.

89. Basis of calculating grants for military and railway churches.—During 1907 the question of revising the method of assessing grants

Despatch to Secretary of State, No. 26-P.W., for the erection of churches in military stations was taken up. In a despatch to

the Secretary of State the Government of India reviewed the history of the rule by which such grants were determined on the basis of a local plinth area rate, explaining that the rule did not in practice provide a reasonable scale of expenditure for buildings of ecclesiastical design. It was accordingly proposed to revise the rule so as to make the basis of calculation the cubic content rate

Despatch No. 47-P.W., dated 25th October 1907 for ordinary first class single-storied buildings of substantial construction, such as

court-houses. The Secretary of State sanctioned this proposal. The arrangement applies both to military and railway churches.

90. Subsidiary works connected with churches.—Sanction was accorded during the year 1908-09 to an expenditure of Rs. 11,059 on subsidiary items (gates, roads, compound wall, etc.) connected with the Rawalpindi Presbyterian church, but, as this action, though conforming to past practice, was not supported by any rule regulating expenditure in connection with churches, the matter was reported to the Secretary of State who was, at the same time, asked to approve of the introduction into the Public Works

Department Code of a rule specifically permitting the charge of expenditure

Despatch to Secretary of State, No. 29-P.W., dated 22nd October 1908. of this nature to the State in addition

Despatch from Secretary of State, No. 61-P.W., dated 18th December 1908. to the grant admissible for the main edifice. His Lordship accepted the principle of the proposal, but suggested that a money limit should be imposed for such expenditure, beyond which his sanction should be obtained.

The Government of India, after a full consideration of the matter, were still of opinion that no useful purpose would be served by prescribing a monetary limit outside which the sanction of the Secretary of State would be

Despatch to Secretary of State, No. 86-P.W., required. They, however, proposed that

if the Secretary of State, after reconsideration, thought that it was necessary to fix a limit, that limit should be put at Rs. 5,000 exclusive of any expenditure which might be incurred on the acquisition

of the site. The Secretary of State agreed to the exclusion of the cost of the site, but was of opinion that the limit in respect of the other items should not be uniform but should vary in proportion to the cost of the main building. His Lordship has accordingly invested the Government of India with power to sanction expenditure on those items up to 10 per cent of the grant permissible under rule. The arrangement applies only to military and railway churches.

91. Liability of the State in respect of the maintenance of church compounds.—The question as to how far the State should undertake the maintenance of church compounds arose, in 1908, out of an enquiry by the Director-General of Military Works as to whether it was intended that, under Public Works Department Code rules, certain charges in connection with church compounds, such as pay of malis, cost of their tools, etc., should be paid by the State from P. W. D. funds. The meaning of the rules in question was not quite clear on the point and in order to enable the Government of India to come to a decision in the matter, local Governments and Administrations, including the Director-General of Military Works, were asked to report as to what charges were being actually incurred on the maintenance of church compounds, and the source or sources from which they were met. On receipt of the required information the question was fully considered by the Government of India and it was decided that the State should not undertake to do more than was necessary to keep the compound in decent order, that is to say, that it should merely repair compound walls, gates, fencing and well, and maintain roads, walks, paths and drains in a fit and proper condition, and that any outlay on operations having for their object the ornamentation of the compound should be met otherwise than from State funds.

92 Designs prepared by Consulting Architect.—The following are the principal designs which have been wholly or partially prepared by the Consulting Architect to the Government of India during the interval covered by this review :—

1. Secretariat, Nagpur.
2. Public Works secretariat, Lahore.
3. Katchery, Jorhât.

1906-07.

1. Church at Dalhousie.
2. Viceregal stables and staff residences, Calcutta.
3. Roman Catholic church, Lebong.
4. Accountant-General's office, Lahore.
5. Residency, Bushire.
6. Residency, Indore (new wing, etc).
7. Protestant church, Lebong.
8. Alterations to ' Peterhoff,' Simla.
9. Presbyterian church, Ambala.
10. Police Training School, Ranchi.

11. Secretariat, Dacca.
12. Church, Ghariâl.
13. Government House, Chittagong.
14. Commissioner's court, Nagpur.
15. Kennedy House secretariat, Simla.

1907-1908.

1. Municipal Library, Simla.
2. Council House Street secretariat, Calcutta.
3. Telegraph Office, Dacca.
4. Forest College, Dehra Dûn.
5. Consulate, Ahwâz.
6. Sanitorium, Puri.
7. Collectorate, Jalpaigûri.
8. Museum, Saranath.
9. Viceregal Lodge, Simla (additions).
10. Belvedere, Alipore (additions).
11. Viceregal Staff residences, Calcutta (further details).
12. Quarters for civil officers, Calcutta.
13. Lucknow cantonment church (re designed).
14. Council House Street secretariat, Calcutta (re-designed).
15. Cawnpore Agricultural College (details).
16. Kennedy House secretariat, Simla (continued).

1908-1909.

1. Gwalior Residency.
2. Offices for Viceregal staff, "Sackville" estate, Simla.
3. Lucknow cantonment church (details).
4. Government Press, Dharamtâla Street, Calcutta.
5. Stationery and Stamp office, Calcutta.
6. Medical College, Calcutta, IV Block.
7. Arts College Rânci, main building.
8. Engineering College, Rânci, main building.
10. Engineering College, Rânci, Water tower.

1908-1909—*contd.*

11. Engineering College, Râncchi, Mining, etc., block.
12. Engineering College, Râncchi, Hostels (review and suggestions).
13. Indore Residency, porch and entrance.
14. Kennedy House secretariat, Simla (detailed drawings).
15. Benâres Judge's Court, preliminary.
16. Agricultural College, Cawnpore (further details).
17. Porch, Town Hall, Simla.
18. Accountant General's office, Lahore, side porches.
19. Clerks' quarters, Simla (preliminary).
20. Clerks' tiffin room, "Gorton Castle," Simla.
21. "Belvedere," new cloak rooms and alterations (preliminary).
22. Barnes Court, Simla, additions and alterations.
23. Houses for Assistant Resident and Residency Surgeon, Bushire.
24. Executive Engineer's office, Delhi, preliminary.
25. Post and Telegraph office, Howrah, preliminary.
26. Bhâgalpur church, new tower and spire.
27. Postal Audit office, Nagpur.
28. The Sculptor's work :—Tympana, finials and cartouches, Wellesley Place, Calcutta ; Pusa College ornament ; ornament for the Accountant-General's office and Public Works Department, Lahore ; Nâgpur Secretariat etc., etc.

1909-1910.

1. Stamp and Stationery office, Calcutta.
2. Cathedral, Nâgpur.
3. District Court, Benâres.
4. Postal Audit office, Nâgpur.
5. Officers' quarters, Dacca, type 2.
6. Officers' quarters, Dacca, type 3.
7. Officers' quarters, Dacca, type 4.
8. Officers' quarters, Dacca, type 5.
9. Lucknow church (further revised).
10. Church at Kotri.
11. Church at Bhatinda.

1909-1910—*contd.*

12. Railway church at Lahore (revision).
13. Craddock High School at Wardha, Central Provinces (elevations and details).
14. Mandalay Post office.
15. Officers' quarters, Calcutta, type A.
16. Officers' quarters, Calcutta, type A with north entrance.
17. Officers' quarters, Calcutta, type B.
18. Officers' quarters, Calcutta, type B with north entrance.
19. Officers' quarters, Calcutta, type C.
20. Post and Telegraph office, Howrah.
21. Dalhousie church.
22. Maymyo church (begun).
23. Executive Engineer's office, Delhi.
24. Civil Engineering College, Ranchi, subsidiary buildings.
25. Council Chamber, Calcutta, galleries, furniture [and personal supervision of construction].
26. Mount Abu Residency (additions).
27. Gate-houses, gates and railing, etc., Dacca Secretariat.
28. Post and Telegraph office, Delhi (preliminary).
29. Gate-houses, "Snowdon," Simla.
30. Barnes Court, Simla, details of ceiling, etc.
31. Postmaster-General's office, Dacca.
32. Proposed cloak-room, "Belvedere," Calcutta (detailed drawings).

DOCKS AND HARBOURS.

93. **Improvement of Madras Harbour.**—The Madras Harbour, the construction of which was begun in 1877, had an eastern entrance, which, besides being subject to ocean swell and not affording a still-water refuge to ships, was affected by shoaling action, due to the steady drift of sand along the shore from a southerly direction, so that the depth of water at the entrance was considerably diminished and there was danger of the sand deposit gradually extending over the whole harbour.

After careful consideration of the views of several experts it was decided, at the end of 1904 during Lord Curzon's Viceroyalty, to close the eastern entrance of the harbour and to construct a new entrance 400 feet wide on the north side, protected by a mole 1,600 feet long, pointing 20 degrees east to

north, *i.e.*, parallel to the coast line. The estimate for the work, as prepared by the Madras Government in 1904, amounted to 46 lakhs of rupees, but the Government of India, at the time, considered that sufficient allowance had not been made for establishment charges, and for the difficult and uncertain character of the work, which would extend over several years, and anticipated that the cost of the project might eventually amount to 55 or 60 lakhs of rupees.

These anticipations proved to be correct and, in October 1906, the Government of India sanctioned a revised estimate amounting to Rs. 55,46,000, the increased cost being due mainly to the outlay on plant, at a cost of Rs. 5,18,000, and the necessity for improving and altering the boat basin, the need for which had not been anticipated in the original estimate.

At the beginning of 1908, the Government of Madras submitted a further enhanced estimate for the improvements to the harbour, amounting to Rs. 60 lakhs which was sanctioned in February 1908. The main cause of the excess on this occasion also was the necessity for additional improvements to the boat basin.

94. New Docks at Bombay.—During Lord Curzon's Administration, in view of the rapidly expanding trade of Bombay and certain defects in the docks, it was decided to make various improvements, especially in the direction of accommodation for the longer and deeper draught vessels now built. The general arrangements contemplated having been scrutinised and considered satisfactory by the Admiralty, the Trustees of the port undertook to construct new wet and dry docks on their Mody Bay estate, at an estimated cost of about $3\frac{1}{2}$ crores of rupees.

In July 1906, the Government of India approved of the following important modifications in the plans of the new docks as proposed by the Trustees of the port ; *viz.* :—

- (I) Moving the whole of the projected docks bodily 200 feet further south.
- (II) Improving the alignment of the harbour wall at the north-east corner of the dock.
- (III) Increasing the depth of water along the harbour wall.
- (IV) Widening the mole.
- (V) Deepening the entrance lock.

These modifications were considered to constitute a distinct improvement in the project as originally sanctioned and to add very considerably to the accommodation which the new docks will afford to trade. It was, however, to be distinctly understood that the approval to these modifications would in no way confer special or increased claims on the part of the Port Trust over the foreshore or waterway to the south of the docks and was without prejudice to the formation of a Naval basin if required hereafter.

95. Port of Calcutta.—The Commissioners of the port of Calcutta, having had the subject of the improvement of the navigable channels of the river Hooghly under consideration for some time past, decided that an effort should be made to deepen the water over the bars by means of dredging. After

considerable discussion as to the class of dredger to be obtained, it was eventually decided to purchase a powerful dredger of the suction type capable of dealing with at least 5,000 tons of sand per hour; and, in December 1905, the Government of India accorded formal approval to an expenditure of about 11 lakhs for the purpose.

The general improvements of the port of Calcutta have also received the attention of the Government of India, and from time to time approval was accorded to the following important works aggregating an expenditure exceeding 80 lakhs of rupees :—

1. Construction of 4 additional berths in Dock No. 2 for large steamers	Rs.
2. Purchase of certain properties in or near Garden Reach for extension of the Docks	39,84,270
3. Acquisition of additional land	15,00,000
4. Excess expenditure on a revised estimate for the construction of timber ponds at Sibpur	3,04,215
5. Construction of 4 pontoon landing stages with spurs and abutments on the left bank of the river Hooghly	2,56,140
6. Excess expenditure on an estimate of Rs. 2,09,210, sanctioned in 1904, for providing an additional floating crane...	2,33,640
7. Construction of a passenger landing stage for ocean going steamers at Outram Ghat	29,963
8. Construction of a new graving dock, slipway, etc., at Kidderpore	4,54,222
9. Provision by the Port Commissioners of a site equipped with the necessary buildings in exchange for the land and buildings of the Army Remount Department at Garden Reach	5,70,141
	8,06,843
Total	<u>80,89,434</u>

96. **Port of Chittagong.**—In order to render this port an efficient outlet for the trade of Eastern Bengal and Assam, it was decided that the bars in the river approach should be removed by dredging and that the river bank for a considerable length should be revetted. These improvements, including the cost of a dredger, were estimated to cost from 25 to 30 lakhs of rupees, and as the provincial Government was not in a position to meet the entire cost of the scheme, the Government of India came to its assistance with a contribution of 10 lakhs from imperial revenues. The total cost of the dredger, fitted with supplementary apparatus for the disposal of the sludge, amounted to Rs. 6,39,676. The local Government subsequently, in March 1906, applied to the Government of India to increase the subvention of 10 lakhs from imperial revenues, but, in view of the allotment under Provincial Civil Works in the new settlement having been raised to Rs. 37,50,000, the application was not considered favourably. At the same time it was intimated to the local Government that if the Port Commissioners had not sufficient funds immediately available for the completion of the works, the proper course for them was to make up the amount required by borrowing on the securities of the port, which would doubtless be considerably enhanced by reason of the improvements.

The local Government, however, in January 1910, represented that, owing to the present position of the provincial finances, no further help beyond the maximum contribution of 10 lakhs promised to the Port Trust could be

given from provincial revenues, and the Government of India, with the concurrence of the Secretary of State, sanctioned a further grant of 5½ lakhs from imperial revenues.

97. Improvement of the Port of Moulmein.—The urgent necessity for improving the approaches to the port of Moulmein having been represented to the Government of India, it was decided that this object could best be attained by continuous dredging operations, and accordingly, in July 1902, sanction was accorded to the purchase of a dredger the “Fredric Fryer” at an estimated cost of Rs. 5,29,000.

The dredger was obtained in 1903 and although on trial she proved to be quite satisfactory, the results of her working at Moulmein were disappointing no permanent good having apparently resulted from her operations. In 1906 a committee was constituted consisting of Mr. J. Benton, Inspector General of Irrigation, Mr. H. W. V. Colebrook, Chief Engineer, Burma, Messrs. O. C. Lees and A. E. Rose, Superintending Engineers, Burma, and Commander C. W. R. Hooper, Principal Port Officer, by whom the whole question was reconsidered.

The committee assembled at Moulmein on the 30th November 1906 and in February 1907 the local Government submitted its report dated 10th December 1906, recommending the obstruction of the Eastern Mopun Island channel, this being an easier task than the closure of the Long Island channel as originally proposed by Mr. J. Benton in 1901, and a work which would facilitate the execution of the latter later on. The closure of both the Mopun and Long Island loops were admitted by all concerned to be desirable measures, and the question arose as to which should be undertaken first. An estimate amounting to Rs. 1,04,220 was prepared for giving effect to the recommendations of the committee of 1906, but when under the consideration of the local Government, the Port Officer, Moulmein, reported particulars of certain recent changes in the channel opposite the Mopun Island. At the request of the Lieutenant-Governor of Burma, Mr. Benton drew up a note, on the 31st January 1908, in which he advised adherence to the programme of operations recommended by the committee of 1906. This note was forwarded to the local Government for consideration on 13th March 1908.

98. Training of the Rangoon river.—The immense development of trade from Burma in recent years necessitated an increase in the facilities for shipping at the port of Rangoon, and a scheme was prepared chiefly with the object of training of the Rangoon river.

In this connexion the Government of Burma submitted, in August 1906, proposals, for works estimated to cost about 93 lakhs of rupees, for training of that portion of the Rangoon river which forms the harbour at Rangoon. It was evident that the engineering problem presented many difficulties besides involving very heavy expenditure, and the Government of India, while sharing the views of the local Government regarding the importance of taking early steps to improve the condition of this portion of the river in the interests of the port, were of opinion that the question should receive careful consideration before embarking on work which might fail and lead to a waste of money. Acting on professional advice they therefore suggested to the local Government the advisability of convening a committee of engineers to review the position and to formulate a plan of operations, and at the same time they forwarded to the Government of Burma a note by the Inspector-General of Irrigation dealing with the whole project.

The proposed committee was duly convened and consisted of—

President.

Mr. J. Benton, Inspector-General of Irrigation.

Members.

Mr. J. R. Bell, late Consulting Engineer for Railways to the Government of India.

Mr. H. W. V. Colebrook, Chief Engineer, Burma.

Mr. G. C. Buchanan, Chairman, Rangoon Port Trust.

Mr. O. C. Lees, Superintending Engineer, Burma.

The Government of Burma on the 17th April 1907, submitted the committee's report on the entire project, the estimated maximum cost of which was put down at $1\frac{1}{4}$ crores of rupees, and asked for a favourable consideration of the financial aspect of the scheme.

The Government of India, after carefully considering the local Government's proposals, agreed to the following important arrangements, subject to the sanction of the Secretary of State which was subsequently received:—

- (i) An Imperial grant of 25 lakhs to be spread over the next two or three years, as required.
- (ii) A grant from provincial revenues of such amount as the local Government thought proper, not, however, to exceed twenty-five lakhs, in any case, and to be spread over such period as might be found convenient.
- (iii) The Port Trust to borrow the remainder of the money in the open market with a sinking fund of the amount required on the assumption that it will improve at the rate of 3 per cent.
- (iv) Detailed plans and estimates to be prepared for the whole work but no expenditure to be incurred in anticipation of sanction.
- (v) The purchase of a suction pump dredger at an estimated cost of Rs 11,03,850, which was in due course sanctioned by the Government of India in July 1907.

In December 1907, the local Government submitted a fresh estimate amounting to Rs. 98,80,383, but the Government of India sanctioned provisionally an outlay of Rs. 92,01,948 only, pending the submission of an amended estimate in respect of certain technical details. Subsequently, in March 1909, certain further proposals were submitted by the Government of Burma and were generally approved by the Government of India, who, however, requested the submission of a definite programme of the operations and a detailed estimate of the cost. Accordingly, in January 1910, the local Government submitted an amended revised estimate amounting to Rs. 1,33,68,573 and recommended the accordence of sanction to the estimate as revised involving an ultimate expenditure of Rs. 1,10,92,500 and an initial outlay of Rs. 1,28,01,034.

On certain technical grounds, the Government of India were unable to accept this detailed estimate and, on the 21st April 1910, they asked the local Government to submit a further estimate with a report and specification as required for important projects advanced by the Public Works Department, and at the same time pointed out that such difficult and costly work, to which the imperial and local Governments had contributed to the extent of 25 lakhs each, should receive adequate treatment at the hands of the port authorities.

In September 1910 the local Government expressed their inability to submit till 1911 a further estimate and in the meanwhile asked sanction to an expenditure of Rs. 1,34,10,607 which would ultimately be reduced to Rs. 1,17,02,073 after taking credit for the value of the disposable plant.

The local Government also urged that owing to the difficulty experienced in sinking mattresses during the rains it was desirable that this portion of the work should be pushed on to completion. The matter is now under the consideration of the Government of India.

99. Vizagapatam Harbour Improvement.—The question of improving the Vizagapatam harbour has been under consideration at various times for a period of nearly fifty years, but the problems which call for solution are of such complexity that the opinions of the engineers who have advised on the measures to be taken have been contradictory and divided. As long ago as 1892 the project was investigated by Mr. Thorowgood, an expert sent out from England at the instance of the Government of India. It was, however, decided not to act upon Mr. Thorowgood's recommendations, partly because it was feared that the remedies he suggested would prove inadequate but more especially because the Government of Madras were not then in a position to finance the scheme. In the period of 16 years which has intervened since the receipt of Mr. Thorowgood's report, sufficient experience has been gained to place it beyond doubt that the requirements of Vizagapatam are such as to call for the inception of a scheme of much greater magnitude than was contemplated by that officer. The extension of the neighbouring railway communications, the geographical position of the town, and the natural configuration of the site alike combine to render it of great importance to provide harbour accommodation on a scale commensurate with the steadily increasing volume of trade frequenting the port.

The Government of Madras accordingly in October 1906, submitted a scheme for improving the port involving an expenditure of over a crore of rupees, but having regard to the scope of the project, to the large expenditure proposed and the divergence of opinion on the subject, the Government of India came to the conclusion that it was desirable to obtain the best professional advice available in England before embarking on the scheme, and

Public Works Department Despatch, No. 22-P.W., dated 3rd September 1908. the Secretary of State was asked in September 1908, to select and depute an expert Harbour Engineer to advise on the project.

In response to this request, the Secretary of State in October 1909, sent out reports by Sir Alexander Rendel, K.C.I.E., and Sir William Matthews, K.C.M.G., in which both these experts recommended the adoption of a type of enclosed harbour at a probable cost very much in excess of the 110 lakhs which had been assumed sufficient for the isolated break-water recommended by the Government of Madras. These reports were forwarded to the Government of Madras in November 1909 for information and such action as might be considered necessary.

COAST LIGHTS.

100. Burma Coast Lights.—At the instance of the Government of Burma the question of improving the light-houses off the coast was referred to the Secre-

Public Works Department Despatch, No. 36 P. W., dated 14th December 1905. tary of State for the advice of the Elder Brethren of Trinity House, London, and

the proposals of the latter, which had been carefully examined by the local officers, were generally accepted. The importance of the Burma Coast lights and the necessity for introducing the improvements suggested were fully recognised by the local Government, which expressed the intention of carrying out the several projects as rapidly as circumstances would admit. A characteristic feature of the improvements is the proposed introduction of the incandescent oil system of lighting in all the light-houses.

101. Beacon Island light house.—This important light has just been completed. Beacon Island is situated some five miles west of Chedubu Island and forty miles from Kyaukpyu and is no more than a large sandstone rock in the ocean. The lighting of this rock, forming part of a group known as the Terribles, was contemplated some twenty years ago and its necessity was recognised in 1900. The preliminary works consisting of a steel jetty, tanks and quarters were completed in 1904 but a decision as to the type of tower structure was not reached until two years later. Owing to the possibility of damage from earthquakes the Government of Burma hesitated to adopt the cast iron form of structure which had been recommended by the Elders of the Trinity House and favoured a plain concrete tower, more especially on account of its relative cheapness. The Government of India suggested the alternative of a reinforced concrete structure but, after further consideration, the cast iron form of construction was adopted in 1908 and completed in a single working season. The light house as now equipped stands with a focal plane 125 feet above sea level and gives a double flashing dioptric light of 210,000 candle power at a range of eighteen miles.

102. Algnada Reef light-house.—The impact of the waves against the overhanging rock and along the chasm under the rock on which this important light-house stands, was found to cause a perceptible tremour in the upper room of the tower. The Government of Burma, being apprehensive of the safety of the structure, submitted in March 1907, a short history concerning this chasm, and suggested that the advice of the Board at the Trinity House, London, might be obtained on the measures necessary to ensure the permanent safety of the tower. On examining the papers, the Government of India considered that reference to the Trinity House was unnecessary, and advised the carrying out of a scheme for filling up the chasm near the light-house on the lines proposed in 1892 by Sir Alexander Rendel, the Consulting Engineer at the India Office.

STORES.

103. Purchase of stores for the use of the Public Works Department.—A committee was appointed in February 1906 to enquire into the procedure followed in purchasing stores for the use of Government departments in India, to report on the defects in the practice in vogue, with special reference to facilitating purchases and to affording encouragement to local industries, and finally to formulate rules with the object of effecting necessary improvements in the existing system. Their recommendations duly received the careful consideration of the Government of India and formed the subject of lengthy correspondence with the Secretary of State, who agreed that the existing rules and procedure regarding the purchase of stores might with advantage be modified so as to give greater encouragement to the purchase, in India, of articles which were either produced or manufactured locally. His Lordship approved of the local purchase of imported stores subject to a low value limitation. He also accepted, conditionally, the proposal that in the case of important construction works let out to Indian firms of approved standing, the supply of English

stores required for the construction might be included in the contract. The proposal of the stores committee for the establishment of an inspecting staff for the purpose of testing and passing supplies purchased in India was also sanctioned. The rules for the purchase of stores, as finally accepted by the Secretary of State, as an experimental measure, were incorporated in Appendix 30 of the Public Works Department code, III, in supersession of the old rules. It was impressed on all concerned that the policy of Government is to encourage the purchase of articles locally manufactured or produced, and that, in future, preference should be given to such articles when the quality is satisfactory and the price not unfavourable.

104. Revised financial powers of Public Works Department officers in respect of the local purchase of stores of foreign manufacture.—The former limits of power of Public Works officers to purchase, locally, stores of foreign manufacture were enhanced. The following statement gives a comparison of the old and the new limits, respectively—

Class of Officers.	FORMER LIMITS.	REVISED LIMITS.	
	Applicable under certain conditions, <i>e.g.</i> , when urgency or economy can be proved in justification of the local purchase.	In cases in which urgency or economy can be proved in justification of the local purchase.	When the articles are already in India at the time of order and the cost of supply does not exceed the limits of the powers of the officers as shown below.
	Rs.	Rs.	Rs.
Executive or Assistant Engineer holding charge of a Division.	200	500	200
Superintending Engineer or Superintendent of Works.	1,000	2,500	1,000
Local Government or Administration ..	Full powers	Full powers	3,000

ELECTRICITY.

105. Indian Electricity Act, No. IX of 1910.—The necessity for an important amendment of the Indian Electricity Act, No. III of 1903, in order to provide for the supply of energy in bulk, having been brought to the notice of the Government of India, a committee was appointed to examine the question. This committee suggested many improvements and, *inter alia*, recommended that the Government of India should undertake the direct administration of the Act, and that licenses should be granted by the Governor General in Council instead of by the local Governments

* Despatch to the Secretary of State, No. 25-P.W., dated 17th September 1908.

† Telegram from the Secretary of State, dated 1st December 1908.

‡ Despatch to the Secretary of State, No. 3-P. W., dated 4th February 1909.

concerned. The Secretary of State, however, when approached* on the subject of the introduction of a Bill to give effect to the Committee's proposals was unable† to sanction the proposed direct administration of the Act by the Government of India. In forwarding‡ for the approval of the Secretary of State a revised draft Bill, prepared in accordance with His Lordship's instructions, the Government of India again expressed themselves very strongly in favour of the original draft Bill providing for the direct administration of the Electricity Act by them.

The Secretary of State intimated* in reply that after carefully considering

*Despatch from the Secretary of State, No. 18-P. W. dated 7th May 1909.

the arguments to which the Government of India had drawn his attention he still adhered to the opinion that, on grounds of general policy, the Electricity Act should be administered locally, provided that full power of control was reserved to the Government of India. In the revised draft Bill it was proposed to meet the difficulty in respect of areas of supply extending beyond the limits of a single province, or which included cantonments or other places occupied for naval or military purposes by retaining in the hands of the Government of India all powers under the Act. These provisions of the Bill still appeared to the Secretary of State to go beyond what was necessary to secure due control by the Government of India over business confided to local Governments. The Secretary of State made certain further remarks and suggestions for amending the Bill, subject to which he sanctioned the introduction of the revised draft in the Governor General's Council. The Bill, with the necessary modifications, was introduced on the 30th July 1909 and with certain amendments made in Council, passed into law in March 1910.

106. Revised rules under the Indian Electricity Act.—The necessity for revising the rules under the Indian Electricity Act of 1903, having been brought to the notice of the Government of India, a technical committee was appointed in 1908 to advise in the matter. In their report, submitted in March 1910, the committee suggested important modifications in the old rules and expressed the opinion that the revised draft rules prepared by them would be requisite and practical under the new Indian Electricity Act. The draft rules have been examined by the Government of India and, with certain modifications, have been published in the Gazette of India for general information and criticism. These draft rules will, with such further modifications as may be necessary in view of the criticism thereon, be issued as the rules under the Indian Electricity Act, No. IX of 1910.

107. Grant of electric licenses.—The following licenses were granted by the Government of India under the Indian Electricity Act, No. III of 1903:—

- (i) To Messrs. Kilburn and Co, Calcutta, for the supply of energy within the cantonment of Barrackpore. This license has since, with the sanction of the Government of India, been transferred to a company entitled the Barrackpore Electric Supply Company, Limited.
- (ii) To the British Eastern Electric Power Company, Limited, London, for the supply of energy for electric traction and general supply in the cantonment of Lucknow [*vide* also para. 111 (i)].
- (iii) To Messrs. Kilburn and Co., Calcutta, for the supply of energy for electric traction, and for the general supply of energy to the public, including the supply of energy to particular consumers under special agreements in respect of the cantonment of Jubbulpore [*vide* also para. 111 (ii)].
- (iv) To the Calcutta Electric Supply Corporation, Limited, for the supply of energy for electric traction, and for the general supply of energy within the Dakhineswar Magazine, the Government

Dockyard at Kidderpore and other places in Calcutta and its environs that are subject to section 40 of the Indian Electricity Act, 1903.

- (v) To the Rangoon Electric Tramway and Supply Company, Limited, for the supply of energy to the public for the purpose of general supply and to particular consumers under special agreements but not for electric traction within the limits of the cantonment of Rangoon.
- (vi) To the Burma Electric Tramways and Lighting Company, Limited, for general supply and the supply of energy to particular consumers under special agreements, but not for traction, in respect of the area comprised within the limits of the Mandalay cantonments.
- (vii) To the Madras Electric Supply Corporation, Limited, for general supply and the supply of energy to particular consumers under special agreements in respect of Fort St. George and its glacis and all Government military and naval places within the Madras municipal area

The following licenses were granted by the local Governments concerned under the Indian Electricity Act, 1903, with the previous sanction of the Government of India to certain clauses :—

- (viii) To Messrs Killick, Nixon and Company and John Fleming and Company, Bombay, for the supply of electric energy in the Hooghly River District, Bengal.
 - (ix) To the Electric Supply and Tramways Company, Limited, Bombay, for the supply of energy for electric traction in respect of the city, town and island of Bombay.
 - (x) To Messrs. Kilburn and Company, on behalf of the Calcutta Electric Supply Corporation, Limited, for electric traction and general supply in the town of Calcutta and its environs.
 - (xi) To the Barrackpore Electric Supply Company, Limited, for the supply of energy for electric traction, for the general supply of energy to the public, and for the supply of energy to particular consumers under special agreements, within the sub-division of Barrackpore.
 - (xii) To Messrs. Kilburn and Co., Calcutta, for the supply of energy for electric traction and for the general supply of energy to the public including the supply of energy to particular consumers under special agreements within the municipal area of Jubbulpore.
- (This license has since been revoked by the Central Provinces Administration, the Company having failed to comply with the provisions of clauses 1 (a) and (b) of the schedule to the Indian Electricity Act, 1903).
- (xiii) To the Burma Electric Tramways and Lighting Company, Limited, for the supply of electrical energy within the municipal area of the town of Mandalay.

(xiv) To Messrs. Hoare, Miller and Company, Calcutta, for the supply of electric energy to the public and for electric traction in certain portions of the Burdwan and Manbhum districts in Bengal.

(xv) To the Bengal Coal Fields Power Company, Limited, Calcutta, for the general supply of energy and for electric traction in certain portions of the Burdwan and Manbhum districts, in place of the subsisting license which was granted to Messrs. Hoare, Miller and Company, (*vide* preceding item).

108. **Concession for water power on the Bari Doab Canal.**—With the approval of the Government of India an important concession for water power on the Bari Doab canal was granted by the Government of the Punjab to the Punjab Power Association in 1903.

109. **Proposed grant of a concession for the use of water power on the Jumna river.**—Two draft agreements relating to the concession which it is proposed to grant to the United Provinces Power Association for the use of water power on the Jumna river are now under consideration.

110. **Grant to licensees under the Indian Electricity Act, 1903, of the powers which the telegraph authority possesses under sections 10 to 19 of the Indian Telegraph Act, 1885.**—The powers which the telegraph authority possesses under sections 10 to 19 of the Indian Telegraph Act, 1885, with respect to the placing of telegraph lines and posts for the purposes of a telegraph established or maintained by the Government or to be so established or maintained, were conferred under section 35 of the Indian Electricity Act, III of 1903, upon :—

- (i) Messrs. D. J. Tata and R. J. Tata of Bombay, the licensees under the Bombay hydro-electric license, 1907, for the placing of appliances and apparatus for the transmission of energy for the purpose of their undertaking between certain places.
- (ii) the Municipal Board of Mussoorie, the licensee under the Mussoorie (Municipal) Electric License, 1908, for the placing of appliances and apparatus for the transmission of energy for the purpose of the construction and maintenance of high and low tension electric supply lines in connection with the undertaking.
- (iii) the Municipal Commissioners of Darjeeling, the licensees under the Darjeeling Electric License, 1904, for the placing of electric supply lines for the transmission of energy for any purpose authorised by that license.
- (iv) the Municipal committee of Simla, the licensees under the Simla Municipality Electric License, 1909, for the placing of electric supply lines for the transmission of energy for any purpose authorised by that license.

111. **Revocation of licenses.**—(i) The Lucknow Cantonment Electric License, 1907, and the Lucknow Cantonment Electric Traction License, 1907, which had been granted by the Government of India to the British Eastern Electric Power Company, Limited, London, were revoked under the powers conferred by section 4 (2) (c) of the Indian Electricity Act, 1903, in respect of the whole of the area of supply mentioned in that license.

(ii) The Jubbulpore (Cantonment) Electric License, 1907, which had been granted by the Government of India to Messrs. Kilburn and Co., Calcutta, was revoked under the powers conferred by section 4 (2) (c) of the Indian Electricity Act, 1903, in respect of the whole of the area of supply mentioned in that license.

112. International conference on electrical units and standards.—

Despatch from Secretary of State, No. 6. Telegraphs, dated 13th April 1906.

In 1906 the Secretary of State forwarded a copy of the report by a committee appointed by the Board of Trade to consider the steps to be taken to convoke an International commission on electrical units and standards and asked for the views of the Government of India on a proposal that they should be represented on the commission. While intimating, in reply, that no legislation on the subject of electrical units had been undertaken in India, and that no action in this direction was necessary, the Government of India nominated Mr. M. G. Simpson, the Electrician of the Indian Telegraph Department, who was then on leave in England, as their representative. Mr. Simpson accordingly attended the International conference which assembled in London in October 1908 to consider and advise as to the steps which should be taken to bring about agreement in the definitions of electrical units which form the basis of legislation in different countries, and in the methods of determining and employing the electrical standards necessary to give effect to those definitions. Reports by the delegates to the conference have since been received.

113. Establishment of a standard electrical testing laboratory in Calcutta.—In 1908 the Government of India approved of the scheme for the establishment of a standard electrical testing laboratory in Calcutta by equipping the existing laboratory of the Government of Bengal with certain additional apparatus so as to make it suitable for carrying out all the necessary standard tests. It was thought at the time that the Indian Electricity Bill would be accepted on the general lines suggested by the Electricity Act Amendment Committee of 1907, *viz.*, that the Government of India would administer the Act. The Government of India were at the same time advised that it was desirable that the newly constituted laboratory should be fully equipped as soon as possible after the new Electricity Act came into force. In accepting this view they had approved of the submission of indents on the Director General of Stores for such electrical standard instruments and laboratory apparatus as were considered absolutely necessary for the probable immediate needs of the laboratory.

The original scheme was, however, materially modified owing to the adoption of the decentralized Bill under the provisions of which all local Governments were eventually to make their own laboratory arrangements for all ordinary testing work. It was accordingly suggested to the Government of Bengal that, in the altered circumstances, the best arrangement would be that the local Government should retain its laboratory for all ordinary testing work, and that the additional apparatus indented for, in order to complete the equipment of that laboratory, should be taken over and paid for by the local Government. This suggestion was agreed to by the Government of Bengal. It was also decided on the suggestion of that Government, that while the ultimate standards of reference would remain the property of the Government of India they would be handed over to the local Government for housing and safe

custody. Furthermore that on the receipt of a requisition for a reference to the standards by the Electrical Adviser to the Government of India, the necessary tests would be carried out by the Bengal laboratory in the presence of the Electrical Adviser, who would countersign the certificate, all fees for such tests being paid to the laboratory and credited to the Government of Bengal.

114. Supply of electrical energy to the Temperance Association room in Fort St. George.—Permission was accorded to the Madras Electric Supply Corporation, Limited, as a special case, to supply electrical energy to the Temperance Association room in Fort St. George in anticipation of their being granted an electric license for the cantonment area.

115. Agreement for the supply of electric energy to Government buildings in Rangoon.—With the approval of the Government of India an agreement was entered into with the Rangoon Electric Tramway and Supply Company, Limited, for the supply of electric energy to Government buildings in Rangoon.

116. Special charges for large consumers of electricity for the areas covered by the Calcutta Municipal and Cantonment electric licenses.—Certain rates of maximum charges were approved by the Government of India for consumers of electricity who have not less than ten kilowatts installed either in one motor or in an aggregate of motors of not less than one kilowatt each for areas covered by the Calcutta Municipal and Cantonment electric licenses which had been granted to the Calcutta Electric Supply Corporation, Limited.

117. Agreement for lighting the streets of the Barrackpore Cantonment.—The draft of an agreement proposed to be executed between the Barrackpore Electric Supply Company, Limited, and the Cantonment Committee of Barrackpore for lighting the streets of the Barrackpore Cantonment is under consideration.

118. Combined undertakings for electric traction and the general supply of electric energy for lighting and power.—Certain difficulties in regard to undertakings for electric traction, especially when combined with the general supply of electrical energy for lighting and power, having been brought to the notice of the Government of India, local Governments and Administrations were asked to furnish the Government of India with their views on the points dealt with in a note drawn up by the Electrical Adviser to the Government of India on the subject and on the various suggestions for meeting the difficulties explained in that note. The replies of the local Governments are now under consideration.

119. International Electro-technical Commission.—The Secretary of State was addressed with the object of this country joining the Commission by the annual payment of a subvention of £ 50 which would ensure the supply to the Government of India of all papers, reports, etc., issued by the central office. The Secretary of State sanctioned the payment of the subvention and arranged for the supply to the Government of India of 5 copies of all literature published from time to time by the Commission.

120. Prospects of generating electricity from water power in certain provinces.—During the Viceroyalty of Lord Curzon certain local Governments and Administrations were addressed on the subject of maintaining

Despatch to Secretary of State, No. 2-P.W., dated 27th January 1910.

Letter No. R. and S 368, dated 24th March 1910, from the Revenue and Statistics Department, India Office.

and publishing for general information a statement showing the sites at which hydraulic power is available for the generation of electrical energy. The information has since been collected and embodied in a "Note on the prospects of generating electricity from water power in Madras, Bombay, Bengal, the United and Central Provinces."

121. Electric Power schemes in India.—It was considered that a résumé of information relating to electric power schemes in various parts of India would be very useful. Local Governments and Administrations were therefore asked to furnish the requisite information. The replies of local Governments have been received and a list of electric power schemes is under preparation.

122. Works inspected by the Electrical Adviser to the Government of India and projects on which he advised local Governments.

1905-1906.

(i) *Rangoon Electric License.*—The Electrical Adviser was consulted by the Government of Burma in regard to a scheme for electric lighting and traction along certain roads within the Rangoon Cantonment.

(ii) *Electric Installation in the Agricultural College at Pusa.*—At the request of the Government of Bengal the Electrical Adviser inspected the site and drew up a preliminary scheme for an electric installation at the Agricultural Research Institute and College at Pusa. The scheme has since been carried out.

1906-1907.

(iii) *Electric Power Installation for Poona from the Nira Canal.*—The Electrical Adviser drew up a Report on the Nira Canal electrical project in the Bombay Presidency.

(iv) *Electric Installation at Government House, Peshawar.*—The Electrical Adviser visited Peshawar and made suggestions for improving the electric installation at Government House, which were duly accepted.

1907-1908.

(v) *Electric Installation at Government House, Peshawar.*—The Electrical Adviser again inspected the installation at Government House, Peshawar, and made certain further recommendations.

(vi) *Electric Installation at the Bombay Mint.*—The Electrical Adviser inspected and passed the installation at His Majesty's Mint, Bombay.

(vii) *License for the supply of electric energy in Calcutta and its surroundings.*—The Electrical Adviser advised the Government of Bengal regarding a comprehensive license which it was proposed to grant to the Calcutta Electric Supply Corporation, Limited, in place of their several pre-existing licenses.

(viii) *Bombay Hydro-Electric License.*—The Electrical Adviser inspected the route of the high tension transmission line in connection with the Hydro-Electric project at Bombay. Powers under the Telegraph Act were subsequently conferred on the company, under section 35 of the Indian Electricity Act, 1903.

1908-1909.

(ix) *Electric Lighting, Quetta Residency*.—The Electrical Adviser drew up a specification for an installation of electric light in Quetta Residency.

(x) *Electric Lighting, Shillong*.—The Electrical Adviser visited Shillong at the request of the local Government and drew up a detailed scheme for utilizing local water power for public and private lighting in the town.

1909-1910.

(xi) *Madras Electric Supply*.—The Electrical Adviser was consulted by the Madras Government regarding the suitability of the methods of construction of aerial lines as proposed by the local company, in accordance with section 17 of the Indian Electricity Act, 1903; also with regard to the grant to the same company of a further license for the area of supply vested in the Trustees of the Port of Madras, which was excluded from the Municipal license of the company.

(xii) *Patiala Electric Supply*.—At the request of the Patiala Durbar received through the Punjab Government, the services of the Electrical Adviser were lent to advise on certain competitive projects for the lighting of the city and the palace. The scheme, as decided on, is in course of execution.

(xiii) *Barackpore Public Lighting*.—An agreement between the Barrackpore Electric Supply Company and the Cantonment Committee, regarding the lighting of the roads in the Cantonment was referred to the Electrical Adviser by the Magistrate of the 24 Parganas.

(xiv) *Mussoorie Hydro-Electric Scheme*.—At the request of the Government of the United Provinces, the Electrical Adviser joined a committee appointed to consider the question of the re-alignment of the pressure pipes supplying water to the turbines at the Mussoorie Municipal electric supply station, which had been wrecked in a landslip caused by abnormal rainfall.

(xv) *Indore Residency Electric Installation*.—In accordance with the terms of the contract, the Electrical Adviser inspected and passed the installation of lights and fans at the Residency, Indore.

(xvi) *Simla Hydro-Electric Project*.—The local Government and the officer in charge of the work at Basantpur consulted the Electrical Adviser on various matters connected with the scheme, now being carried out, for the lighting of Simla; and the Electrical Adviser inspected the site of the works.

(xvii) *Chittagong*.—At the request of the Government of Eastern Bengal and Assam, the Electrical Adviser visited Chittagong to advise regarding the supply of electrical energy to the town from water power in the neighbourhood and also to make proposals for an installation of lights and fans in Government House and the Circuit House.

MISCELLANEOUS.

123. *International Road Conferences*.—At the instance of the Consul General of France at Calcutta, Mr. B. K. Finnimore, Superintending Engineer, Bengal, Public Works Department, then on leave in England, was appointed a delegate to represent India at the first international road conference, held in

Paris in October 1908, to consider the question of the construction of roads suitable to the requirements of modern methods of locomotion. Mr. Finnimore also attended a meeting of the Permanent International Association of Road conferences held in Paris on the 29th March 1909, and submitted a useful report on the first conference held in October 1908.

Owing to the circumstances of India being different from those of most of the countries concerned, and to the fact that it is impossible to send delegates frequently from India to Paris without great expense and interruption of duties, the Government of India informed* the Secretary of State that they would wait until the International Association was established and then decide on the fuller information available whether India should join or appoint an annual delegate. The Government of India however have desired to be represented at the second international road conference to be held in Brussels in 1910 and have nominated Brevet-Colonel MacLagan, R. E., Superintending Engineer, Punjab, who will be on leave in England, a delegate to represent India on that occasion.

*Public Works Department Despatch No. 17-P.W., dated the 15th July 1909.

124. Plassey Obelisk.—A stone obelisk 30 feet high, the base panelled with bronze tablets bearing suitable inscriptions, was erected on the field of Plassey, to commemorate the battle, in accordance with a proposal which originated in a visit paid in 1905 by Lord Curzon, accompanied by His Excellency the Commander-in-Chief and the Lieutenant-Governor of Bengal (Sir Andrew Fraser), to the spot.

ESTABLISHMENTS.

125. Summary of measures affecting the establishment.—The more important measures affecting the establishment or individual branches of it, which have been under consideration, or on which definite orders have been issued during Lord Minto's Viceroyalty, may be summarised under the following heads:—

Major measures affecting the organization of the whole Department.—

- (1) Strength and recruitment of the engineer establishment.
- (2) New appointments created.
- (3) Separation of the Imperial and Provincial engineer establishments.
- (4) Revision of pay of Royal Engineer officers serving in the Public Works Department.
- (5) Proposed creation of a separate service of Sanitary Engineers.
- (6) Relaxation of the fifty-five-year rule.
- (7) The Minor Administrations List.

126. Strength and recruitment of the Engineer establishment.—In the years 1900-05 the sanctioned strength of the Department was raised from 730 to 911 officers in order to cope with the increasing needs. The main causes which led to this large increase of strength were the impetus given to irrigation works by the recommendations of the Irrigation Commission and the

expansion of railways ; and in addition to providing for its own requirements, the Department had to be prepared to lend the services of engineers to foreign employers when necessary.

The strength of the establishment stood at 911 at the time Lord Minto assumed office, it was shortly afterwards increased to 912 to provide an engineer officer from the Burma establishment for the Andaman Islands, and a further increase took place on the formation of the new province of Eastern Bengal and Assam. It was found that the necessary increase in the number of officers for

Despatch No. 55-Finl., to Secretary of State, dated 22nd February 1906, and despatch No. 31-P. W., from Secretary of State, dated 11th May 1906.

Despatch No. 80-Finl., to Secretary of State dated 15th March 1906, and despatch No. 33-P. W., from Secretary of State, dated 18th May 1906.

Despatch No. 301-Finl., to Secretary of State, dated 23rd August 1906, and despatch No. 70-P. W., from Secretary of State, dated 19th October 1906.

Canal in the Punjab. Finally, in 1907, the establishment was raised to 947 to

Despatch No. 163-Finl., to Secretary of State, dated 9th May 1907, despatch No. 34-P. W., from Secretary of State, dated 21st June 1907, and telegram from Secretary of State, dated 16th July 1907.

Circle in the Punjab.

Of this number 70 are to be Royal Engineers taken from the Indian establishment, 280 Provincial Service officers recruited from Indian engineering colleges and by promotion of deserving subordinates, and the balance civil engineers recruited from engineering colleges in the United Kingdom, who with the Royal Engineers form the Imperial Branch of the Public Works Department. Provincial Service engineers are appointed by the Government of India, and the rate of recruitment has been fixed at 14 per annum. The civil engineers of the Imperial Service are appointed by the Secretary of State, the annual rate of recruitment has been fixed for the present at approximately 25, and 10 per cent of these appointments are open to natives of India who qualify in the United Kingdom.

127. New appointments created—Prior to 1905 the Secretary to the Government of India in the Public Works Department was also Inspector-General of Irrigation. This arrangement was found to be inconvenient owing to the Secretary's absence on tour in connection with his duties as Inspector-General, while the time he could devote to inspection and irrigation work generally had become altogether inadequate to meet the growing demands of this important branch consequent on the recommendations of the Irrigation Commission. The sanction of the Secretary of State was accordingly obtained to the appointment of a whole time Inspector-General of Irrigation on a salary of Rs. 3,500 a month for a period of 3 years which was afterwards extended to 5 years. The recent Royal Commission upon Decentralization have since reported that the utility of the appointment has been generally recognised and on the recommendation of the Government of India the Secretary of State has sanctioned an extension of the tenure of appointment of the present Inspector General of Irrigation until the 6th January 1912. It has been decided to defer consideration of the

the efficient supervision and development of Public Works in the new province, in spite of certain reductions in Bengal, had the effect of raising the strength of the Department to 919. This was raised to 930 on the revision of the Madras cadre, and to 941 in consequence of the formation of additional divisions in the Upper Jhelum and Upper Chenab Canal Circles and the construction of the Lower Bari Doab

meet the need for additional staff in the Buildings and Roads Branch of the United Provinces, and to 953 owing to the formation of the Upper Swat River Canal

question of the retention of the appointment as a permanent arrangement in 1911.

The following administrative appointments have been created during Lord Minto's Viceroyalty :—

Bombay.—One Superintending Engineer for the post of engineer and secretary to the Indus River Commission.

A Chief Engineer for the irrigation works in Sind for three years, during which time a Superintending Engineer's appointment will be held in abeyance.

Eastern Bengal and Assam.—One Chief and one Superintending Engineer for the efficient supervision and carrying out of the public works of this new province. A Sanitary Engineer under agreement for 5 years in supersession of the arrangement under which a Superintending Engineer's appointment was created for this purpose. A Consulting Architect under 5 years' agreement.

Punjab.—A Superintending Engineer for charge of the Lower Bari Doab Canal Circle. A Superintending Engineer for charge of the Upper Swat River Canal Circle. A Superintendent of Works for 2 years to deal with the scheme for the utilization of the Sutlej waters.

Central India.—One Superintending Engineer and Secretary to the Honourable the Agent to the Governor-General in Central India, the public works of which have been separated from those of Rajputana.

Bengal.—A Consulting Architect and a Sanitary Engineer under covenant with Secretary of State for 5 years. The latter appointment supersedes the arrangement under which a Superintending Engineer's appointment was created for sanitary work. An Electrical Inspector who will attend to electrical work in Eastern Bengal and Assam also.

Office of the Consulting Architect to the Government of India.—An Assistant Consulting Architect under covenant with the Secretary of State for 5 years.

128. Separation of the Imperial and Provincial Engineer Establishments.—This question had been under consideration since 1900. The proposals of the Government of India were submitted to the Secretary of State in 1907 and received his sanction early in the following year. The terms of the separation are explained in Public Works Department Resolution No. 675—694-E., dated 24th April 1908. The main outlines of the new organization are that the Imperial and Provincial Officers of the Department will be borne on two separate lists as in all other Departments of the Government of India. The system of grade pay for the executive and assistant classes has been replaced by a purely incremental scale of pay. The scale for Imperial Engineers commences at Rs. 380, and rises by annual increments to Rs. 1,250, in the 20th year of service. Officers of this branch, if duly recommended, will pass into the executive class, the minimum pay of which is Rs. 700, in the 9th year of service but will not be permitted to rise beyond Rs. 800, unless holding a divisional charge or an appointment of equal importance. The scale for Provincial engineers commences at Rs. 250 and rises by biennial increments to Rs. 900 in the 26th

year of service. Officers of this branch will be eligible, if duly recommended, for promotion to the executive class (minimum pay Rs. 650) in the 16th year of service, but such promotion will be dependent on the existence of a vacancy in the divisional charges (75) to be reserved for Provincial engineers. All Provincial engineers then in the Department were given the option of electing the new conditions of service.

This scheme gave rise to considerable dissatisfaction on the part of the Provincial engineers, and not only did the greater number of the officers of this class decline to accept the new terms, but numerous memorials were submitted to Government in which they protested against the main features of the scheme of reorganisation. It was pointed out that the increase of pay sanctioned for the Provincial Service was much less liberal than that given to the Imperial Service and some of the memorialists claimed that they were entitled to pay at two-thirds of the new Imperial scale. The real objection, however, and it is from every point of view the most important, was to the separation of the services and to the differentiation in periods of promotion. The division of the engineer establishment into two entirely distinct and separate services was objected to on the ground that it lowers the status of the Provincial Service, and that it is not in accord with the orders issued in Public Works Department Resolutions Nos. 2112-G. and 2523-G., dated the 19th July 1892 and 28th September 1893, respectively. It was claimed that under these Resolutions officers of the Provincial Service are entitled to promotion *pari passu* with those of the Imperial Service, and that the Government could not without breach of faith introduce a scale of promotion which differentiates between the two services.

The case has received the very careful consideration of the Government of India and they are satisfied that more liberal terms should be offered than were previously thought sufficient. The terms they suggested for consideration by local Governments are :—

- (i) the reservation of ten superintending engineer appointments for the Provincial Service ;
- (ii) the rearrangement of the scale of pay in the assistant and executive classes in the manner explained below :—
 - (a) Assistant Engineer—pay Rs. 250 rising by biennial increments of Rs. 50 to Rs. 450 in the 9th year of service.
 - (b) Executive Engineer—pay Rs. 550 in the 11th year of service, rising by biennial increments of Rs. 50 to the maximum of Rs. 900 in the 25th year, with the proviso that an officer not placed in charge of a division will not rise beyond a salary of Rs. 600.

NOTE —The above rearrangement will necessitate the reservation of 100 divisional charges for the Provincial Service in place of 75 previously proposed.

- (iii) The appointment of selected Provincial officers of not less than seven and not more than fifteen years' service to the Imperial Service. The number of such annual appointments would be limited to 10 per cent of the total recruitment fixed for the Imperial

Service, and these officers would be given the pay on the Imperial scale corresponding with their total length of service.

The replies of local Governments to this reference have been received and the matter is under consideration.

129. Revision of pay of Royal Engineer officers serving in the Public Works Department.—As in the case of civil engineers a yearly incremental scale of pay has been introduced for Royal Engineers in the executive and assist-

Public Works Department, Resolution No. 154—
73-E., dated 11th February 1910.

ant classes. All Royal Engineer officers, who entered the Department between 8th March 1908 and 11th February 1910, will be on a yearly incremental scale starting at Rs. 460 in the 1st year of service, which will be reckoned to commence two-and-half years from date of first commission, and rising to Rs. 1,250 in the 18th year of service. An officer will pass into the executive class, if duly recommended, in the 9th year of service (pay Rs. 800); but he will not be permitted to rise beyond Rs. 900 unless he holds a divisional charge or its equivalent. Royal Engineer officers who entered the Department before the 8th March 1908 have the option of electing the new scale within certain periods. In regard to future entrants the intention is that they should draw the civil scale of pay and a recommendation to this effect has been made to the Secretary of State. All Imperial Engineers, whether civil or Royal Engineers, draw the same rates of pay in the administrative classes.

130. Proposed creation of a separate service of Sanitary Engineers.—Owing to the difficulties experienced in obtaining from the ranks of the Public Works Department officers with sufficient knowledge of sanitary engineering to be entrusted with the charge of large sanitary works and to fill the position of sanitary engineers to the various local Governments, a Committee was convened in September 1906 to consider the situation. The conclusions arrived at by the committee were that, though during the earlier stages of sanitary engineering in India the present arrangements under which officers from the Public Works Department showing an aptitude for this line of work have been entrusted with the duties of sanitary engineers had worked fairly well, the need for thoroughly qualified experts was becoming so pressing that it was essential in the interests of both economy and efficiency that the formation of a separate and distinct service of Sanitary Engineers should be seriously considered. The outlines of a scheme for the establishment of such a service were accordingly prepared and circulated to local Governments and Administrations for opinion.

As the scheme was not favourably received by the majority of the local Governments and Administrations consulted, the Government of India reluctantly decided to abandon it. But it was decided to adopt the following measures with a view to improving the existing system—

- (a) When no fully qualified officers of the Public Works Department are available, experts will be obtained from England on agreements for a term of years.
- (b) Young officers of the Public Works Department, who show a taste for the work, should be given the opportunity of undergoing a

course of training under the sanitary engineer of the Province, or facilities should be afforded them to proceed to England for courses of instruction.

- (c) The Secretary of State has been asked to send out one or two officers occasionally in the annual batch of English recruits for the Public Works Department with some knowledge of sanitary engineering.

131. Relaxation of the fifty-five year rule.—Owing to the depleted state of the engineer establishment, the large number of prospective retirements in the administrative ranks of the Public Works Department, the dearth of senior officers with the necessary experience for the charge of large and important works in progress and in contemplation, and the general expansion of public works, the Government of India decided that it was necessary in the interests of the public service, to relax to some extent the rule requiring officers of the Public Works Department to retire on attaining the age of 55 years. The Secretary of State was addressed accordingly with the result that the Government of India have been authorised for a period of five years from 29th March 1907 to grant extensions of service in the case of selected chief and superintending engineers up to a maximum period of three years.

132. The Minor Administrations List.—Previous to the re-organisation of 1908 the engineer establishments employed in Eastern Bengal and Assam, the Central Provinces, Rajputana and Central India were all shewn on one list known as the "Minor Administrations List" and treated as members of a combined establishment. As an outcome of the re-organisation, the establishments of Eastern Bengal and Assam and the Central Provinces were constituted separate and independent lists and those employed in Rajputana and Central India were amalgamated with the lists of the United Provinces and Central Provinces respectively.

DECENTRALIZATION.

133. The Secretary of State in his despatch No. 57 Public, dated the 2nd April 1909, asked for the views of the Government of India on the recommendations of the Royal Commission upon Decentralization in India, and suggested that the Government of India might find it convenient to convey their views in separate despatches, prepared in the several Departments which are affected by the recommendations in question.

In response to the wishes of the Secretary of State, he was informed, on the

*Public Works Department despatch No. 17 P.W.,
dated 23rd June 1910.

*23rd June 1910, of the decisions arrived at, or the action taken, up to that date, in regard to the Public Works questions contained in Chapter IV, Volume I, of the Royal Commission's report, the more important of which may be briefly summarised as follows :—

134. Paragraph 206. Enhancement of powers to sanction works debited to current revenues.—The Commission's proposal that the powers of the Government of India to sanction works to be executed from current revenues should be raised from Rs. 10 lakhs to Rs. 16 lakhs, excluding establishment and tools and plant charges, or from Rs. 12½ lakhs to Rs. 20 lakhs, including those charges, has been recommended to the Secretary of State whose orders are awaited. The opportunity has been taken of asking the Secretary of State to

enhance the Government of India's authority in the matter of excesses over estimates sanctioned by the former from 10 per cent on the estimate, subject to a maximum of Rs. 10 lakhs, to 25 per cent on the estimate or Rs. 16 lakhs, whichever is less. In respect of the Commission's recommendation that the powers of local Governments to sanction works chargeable to provincial revenues, should also be increased to a limit of Rs. 16 lakhs, it has been decided to defer its consideration pending a decision on another and larger question connected with the financial powers of local Governments.

135. Paragraph 207. Free consultation of the Government of India Architect by local Governments.—Under orders which issued in 1902 it was obligatory on local Governments and Administrations, having no architects of their own, to send, for the approval and criticism of the Consulting Architect to the Government of India, the designs of all public buildings other than those conforming to a standard type, the estimated cost of which was either beyond their powers of sanction or exceeded Rs. 50,000. In accordance with the Commission's recommendation the money limit has been removed and the revised orders make it clear that the Consulting Architect's advice is at the disposal of the local Governments and Administrations in the case of projects which they are competent to sanction, irrespective of the cost involved.

136. Paragraph 208. Enhancement of final powers of sanction of ordinary imperial projects.—The recommendation of the Commission that the powers of major local Governments (including Central Provinces) in respect of final or technical sanction to ordinary imperial projects should be enhanced to Rs. 2 lakhs, and that the powers of Baluchistan and the North-West Frontier Administrations should be slightly raised so as to correspond with those possessed by their technical advisers in respect of military projects, has been accepted and orders have issued accordingly.

137. Paragraph 209. Enhancement of powers of acceptance of tenders for the execution of works.—In accordance with the Commission's recommendation the major local Governments and the Central Provinces Administration have been given full powers to accept tenders for works, chargeable to provincial revenues, within the amounts of the sanctioned estimates. In respect of works debitable to imperial revenues, the powers of local Governments and Administrations have been enhanced up to the limits of their powers of sanction as laid down in Public Works Department Code II, 1925. As regards the acceptance of tenders and contracts by officers of the engineer establishment, the Government of India have decided, after carefully considering the views of the local authorities consulted and the Commission's recommendations, that local Governments and Administrations may, at their discretion, and subject to such general or special limitations as they may think fit to impose, delegate powers to superintending engineers within the maximum limit of their powers to accord technical sanction to estimates, and to executive engineers within the maximum limit of Rs. 5,000.

138. Paragraphs 210 and 211. Enhancement of Engineers technical powers of sanction.—Under the old rules a superintending engineer could ordinarily accord sanction to estimates up to a limit of Rs. 500 only and a specially selected superintending engineer up to Rs. 10,000. The corresponding limits for executive engineers were Rs. 200 and Rs. 500, respectively.

These limits were considered to be so inadequate that the question of enhancing them has been under consideration since 1907, and in that year the Government of India issued a circular letter to local Governments and Administrations inviting their opinions on the subject.

The Commission proposed to allow local Governments and Administrations full discretion in the matter of delegating powers of professional sanction to their subordinate officers ; but after a careful consideration of the views of the local Governments and Administrations, the Government of India decided that it would be a sufficient advance on the present limits if these authorities were authorised to delegate powers, at their discretion, to superintending and executive engineers to sanction finally or professionally estimates for works, whether chargeable to provincial or imperial revenues, up to a maximum limit of Rs. 50,000 and Rs. 2,500, respectively, the minor Administrations being empowered so far as superintending engineers are concerned, to fix the limit at a figure not exceeding the limit of their own powers. At the same time, should it later be found desirable to do so, the Government of India would be prepared to reconsider the question of further extending the powers of superintending engineers or of leaving the limits of these powers entirely to local Governments as proposed by the Commission.

139. Paragraph 212. Enhancement of powers of sanction regarding Government and circuit houses.—The Commission's recommendation that Council Governments should enjoy the same powers in respect of Government houses and circuit houses as they possess with regard to ordinary public works provincial projects, and that the limit of powers of the non-Council major Governments (including Central Provinces) should be raised to Rs. 50,000 has been given effect to. The powers of the minor Administrations, which are not referred to in the Commission's report, have been enhanced so as to correspond with the limit of their powers to sanction ordinary imperial projects.

140. Paragraphs 213-215. Enhancement of powers in respect of residential buildings.—The Commission recommended the enhancement of powers of local Governments in respect of the following :—

- (i) Expenditure on construction of residential buildings.
- (ii) Subsequent outlay on additions and improvements.
- (iii) Assessment of rents.
- (iv) Revaluation of buildings and consequent reassessment of rents.

As regards points (i) and (ii), the question of increasing the powers of local Governments and Administrations in the matter of expenditure on residential buildings had been considered independently by the Government of India prior to the receipt of the Commission's report. In accordance with their decision a circular was issued in 1908, conferring enhanced powers on those authorities. The orders, which are embodied in the Public Works Department Code, (Volume I, paragraph 917), generally speaking, give the local Governments unlimited powers as regards provincial officials whose salaries do not exceed Rs. 500 a month ; and, in the case of officers of higher standing and of imperial officials, powers to sanction outlay based on 12½ per cent of salary, subject to a certain maximum limit. In respect of officers drawing Rs. 1,000 and over, the local Governments are limited to an expenditure based on 10 per cent of salary.

These orders constitute a very substantial advance on those which they superseded, which limited the authority of local Governments to an expenditure based on 8 per cent of the salary of the occupant, and are in some respects even more liberal than the recommendations of the Royal Commission. Moreover, as they were arrived at after very careful consideration the Government of India have decided that they should stand unaltered for the present.

As regards point (iii) mentioned above, it has been decided that the existing rule limiting the rent liability of the tenant to 10 per cent of his salary should be maintained, except that where occupation is in any special case optional, the rule may be relaxed both in the case of imperial and provincial officers at the discretion of the local Government or Administration. As regards rent assessments in general, it has been decided to entrust the local Governments with a larger measure of authority, and their existing powers (P. W. D. Code I, 919, rule IV) have accordingly been extended so as to admit of their sanctioning, at their discretion, the entire or partial remission of the rent ordinarily leviable by rule within the following salary limits :—

- (1) Rs. 500 per mensem where the salary is charged wholly or partly to provincial revenues ;
- (2) Rs. 100 per mensem where the salary is charged wholly to imperial revenues.

In regard to point (iv) referred to above, it has been deemed that no alteration should, for the present, be made in the existing rules (P. W. D. Code I, 919 I (g) and (h)).

141. Paragraph 217. Execution of petty works by non-professional Agency.—The rule regarding the execution of petty works by non-professional agency was, in its original form, liable to be misinterpreted. Paragraph 817, Volume I, of the P. W. D. Code, enjoined that “if possible” works estimated to cost over Rs. 2,500 should be entrusted to the Public Works Department ; the intention of the rule was, nevertheless, to leave to local Governments full authority to permit the execution of provincial public works by civil officers whenever they deemed such a course necessary or desirable. The code has been corrected to make this quite clear.

142. Enhancement of the powers of local Governments in respect of certain irrigation works.—Another matter of decentralization which has been taken up, but which does not find a place in the Royal Commission’s report relates to the powers of sanction exercised by the several local Governments against the Open Capital Account of productive irrigation works. Under existing rules (P. W. D. Code II, 1919) those authorities may sanction estimates chargeable to productive canal systems in operation, up to a limit of Rs. $\frac{25,000}{10,000}$ when the expenditure is $\frac{\text{remunerative}}{\text{non-remunerative}}$, provided that a report of each sanction so accorded is submitted for the information of the Government of India. It is now proposed, with the approval of the Secretary of State, to enhance the above limits to Rs. 50,000 and 20,000, respectively, and to dispense with the submission to the Government of India of the reports of sanctions granted. It is also proposed to dispense with the corresponding reports which the local Governments are at present required to render in respect of sanctions accorded in the case of protective and minor works.

143. Delegation of powers in respect of the appointment and promotion of superintending engineers—The Royal Commission on Decentralization in paragraphs 218—220 of their report recommended that the Governments of the major provinces should be given the power which is already possessed by the Governments of Madras and Bombay, of appointing and promoting their own chief and superintending engineers. The local Governments concerned were consulted on the subject, and after careful consideration it was decided that the Government of India should for the present retain in their hands appointments and promotions to and in the classes of chief engineers and that with effect from the 1st January 1911, the major provinces including the Central Provinces, should carry out all appointments to and promotions in the classes of superintending engineers, the Government of India, however, reserving to themselves the right of making inter-provincial transfers when necessary owing to any very serious inequalities in the flow of promotion in the various provinces.

144. Direct recruitment by local Governments of their provincial engineer and upper subordinate establishments—The Commission proposed that local Governments should be given complete control over the appointment of Engineers and subordinates from the Indian Engineering Colleges. The local Governments have been consulted and the question is now under consideration by the Government of India.

145. Powers of local Governments in respect to Public Works establishments—The Secretary of State has been informed that the Government of India accept the views of the Commission that in regard to Public Works subordinate establishments, local Governments should be under no restrictions which do not apply to Government services generally, but it has been decided to defer the issue of official orders in this matter until the Government of India have dealt with the Commission's recommendation in respect of officers belonging to other provincial and subordinate services.

146. Minor measures of decentralization—It was also explained to the Secretary of State that, in the course of the investigation which the appointment of the Royal Commission evoked, it became apparent to the Government of India that there were many minor measures of reform that might with advantage, be introduced independently of the results of the Commission's enquiries. Indeed some matters of detail were considered to be too minute to be likely to fall within the scope of the report, and it thus happened that some of the recommendations contained in Chapter IV had already been anticipated.

